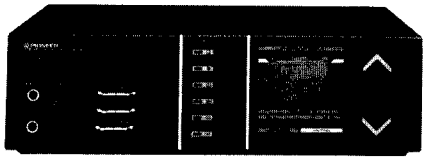
PIONEER

W05

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP-649-0

STEREO AMPLIFIER

A-X700

MODEL A-X700 COMES IN FIVE VERSIONS DISTINGUSHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC120V only	U.S.A. model
HE	AC220V, 240V (switchable)	European continent model
HB	AC220V, 240V (switchable)	United Kingdom model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S. Military model

- **This service manual is applicable to the KU, HE, HB and S, S/G types.**
  For servicing of the HE, HB, S, S/G types, please refer to Pages 30~44.

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1. SPECIFICATIONS

Amplifier Section

Continuous average power output is 45 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.07% total harmonic distortion.

DIN, Continuous Power Output at 1 kHz (both channels driven)
T.H.D. 1%, 8Ω ..... 50 W per channel

Input (Sensitivity/Impedance)
PHONO ..... 2.5 mV/50 kΩ
TUNER, CD, TAPE PLAY, VIDEO/AUX
ADAPTOR ..... 150 mV/50 kΩ
Phono Overload Level (T.H.D. 0.1%, 1 kHz)
..... 75 mV
Output (Level/Impedance)
TAPE REC ..... 150 mV/2.2 kΩ
Frequency Response
PHONO (RIAA Equalization)
..... 20 Hz to 20 kHz ±0.3 dB
TUNER, CD, VIDEO/AUX, TAPE PLAY, ADAPTOR..... 20 Hz to 70 kHz ±2 dB
Tone Control
BASS ..... ±10 dB (100 Hz)
TREBLE ..... ±10 dB (10 kHz)
Muting ..... −20 dB
Loudness Control (Volume control set at −40 dB position)
100 Hz ..... +7 dB
10 kHz ..... +4 dB
Hum and Noise (IHF, short circuited, A network)
PHONO ..... 80 dB
CD, VIDEO/AUX, ADAPTOR, TUNER, TAPE PLAY ..... 97 dB
Hum and Noise (DIN, continuous power 150 mW)
PHONO ..... 73 dB/66 dB
CD, VIDEO/AUX, ADAPTOR, TUNER, TAPE PLAY ..... 85 dB/62 dB

Miscellaneous

Power Requirements
HE model ..... a.c. 220 V ~, 50/60 Hz
HB model ..... a.c. 240 V ~, 50/60 Hz
S, S/G models' ..... ~AC 110 V/120 V/220 V/240 V (switchable), 50/60 Hz
KU model ..... AC 120 V, 60 Hz

Power Consumption
HE model ..... 310 W
HB model ..... 310 W
S, S/G models ..... 140 W
KU model ..... 140 W
Dimensions ..... 320 (W) x 98 (H) x 221 (D) mm
12-5/8 (W) x 3-7/8 (H) x 8-3/4 (D) in
Weight (without package) ..... 5.2 kg (11 lb 7 oz)

Furnished Parts

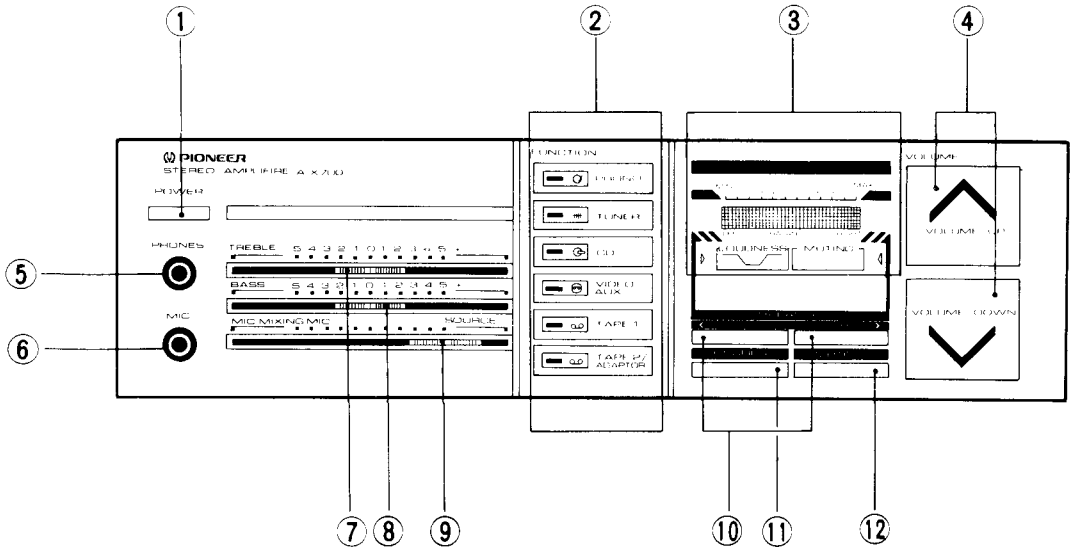
Operating Instructions 1

NOTE:

- *Specifications and design subject to possible modification without notice due to improvements.*
- **Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Claims for Amplifier.*

2. FRONT PANEL FACILITIES

FRONT PANEL



① POWER switch

Press to turn power to the unit ON and OFF.
Depressed position (ON):
Power is supplied to the unit.
Released position (OFF):
Power to the unit is disconnected.

② FUNCTION switches/indicators

[PHONO] — Press when listening to record playback on a turntable.
[TUNER] — Press when listening to AM or FM broadcasts with a tuner.
[CD] — Press when listening to a compact disc playback with a CD player.
[VIDEO/AUX] — Press when listening to programs from a component connected to the VIDEO/AUX terminals.
[TAPE 1] — Press when listening to tape playback with a tape deck.
[TAPE 2/ADAPTOR] — Press when using a component (sound processor, graphic equalizer) connected to the TAPE 2/ADAPTOR terminals. Also can be used during tape playback when a tape deck is connected to these terminals.

NOTE:
When a component is not connected to the TAPE 2/ADAPTOR terminals, or when the component connected is not being used, be sure to set the (TAPE 2/ADAPTOR) switch to the OFF position (the indicator will go out). If set to the ON position, no sound will be heard.

③ FLUORESCENT DISPLAY

[VOLUME/BALANCE] — Normally (VOLUME) indicates the sound volume. The larger the numbers, the larger the sound volume. When the BALANCE switch is pressed, the display's function switches to indicating the right/left balance of sound (after a few seconds, the display will automatically switch back to its volume function).
[LOUDNESS] — Lights when the LOUDNESS switch is set to the ON position.
[MUTING] — Lights when the MUTING switch is set to the ON position.

④ VOLUME switches

These are used for controlling the sound volume.
[VOLUME UP] — Increases the sound volume.
[VOLUME DOWN] — Decreases the sound volume.

⑤ PHONES jack

When using headphones, insert their plug into this jack. The sound from the speakers will automatically be disconnected.

⑥ MIC jack

When using a microphone, insert its plug into this jack.

⑦ TREBLE tone control

Use for adjusting the high-frequency tone.
The central "0" position is the flat (normal) position. When moved to the right, high-frequency tones are emphasized; when moved to the left, high-frequency tones are deemphasized.

⑧ BASS tone control

Use to adjust the low-frequency tone. The central "0" position is the flat (normal) position. When moved to the right, low-frequency tones are emphasized; when moved to the left, low-frequency tones are deemphasized.

⑨ MIC MIXING control

Use to adjust the sound balance between the microphone connected to the MIC jack, and components (tuner, tape deck, turntable, CD player, etc.) connected to the rear panel.
When the control is moved to the MIC side, the sound from the microphone will be at a maximum, while the sound from the other components will not be heard.
When moved to the SOURCE side, the sound from components will be at a maximum, and the microphone sound will not be heard.

NOTE:
When performing playback of source components only, leave the control set to the SOURCE side.

⑩ BALANCE switches

Normally, set so that the control display's BALANCE function indicates at the center position. (When L and R are pressed simultaneously, the balance will be adjusted to the center position.) If the sound heard from the speakers appears to be too loud on one side, adjust as follows: If the right side is too loud, press L. If the left side is too loud, press R.

⑪ LOUDNESS switch

Press when listening at a low volume level.
When pressed ON, the control display's LOUDNESS indicator will light. Very low- and very high-frequency sounds will be augmented, thus giving a more powerful sound quality even at low listening levels.

⑫ MUTING switch

Use to temporarily cut sound volume.
When pressed ON, the control display's MUTING indicator will light, and sound volume will be cut by 20 dB. When set to OFF, the sound will return to its previous volume.

When the power to the unit is turned OFF, a built-in microcomputer automatically memorizes the positions of the following switches, and will maintain that memory for approximately 1 week when the unit is not used. As a result, when the power is turned ON, the previously set switch positions will be set again automatically.

- FUNCTION switches • VOLUME switch
- LOUDNESS switch • MUTING switch
- BALANCE switches

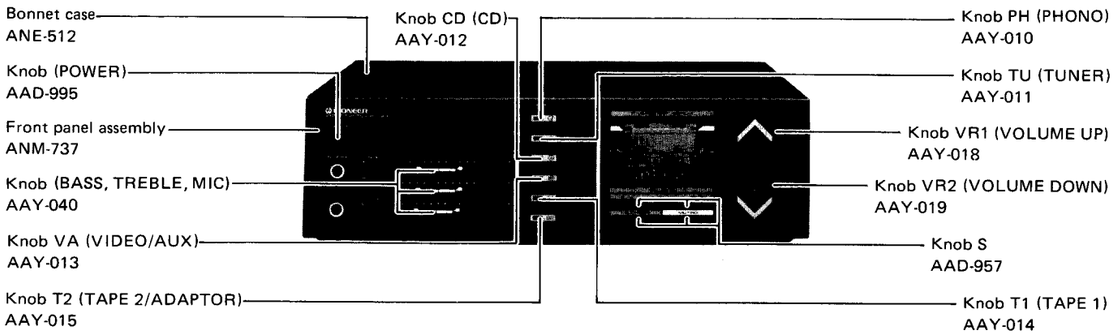
If the unit is not used for more than one week, the memorized positions will be cancelled, and the following positions will be set:

- VOLUME switch – Minimum
- LOUDNESS switch, MUTING switch – OFF
- BALANCE switches – Center

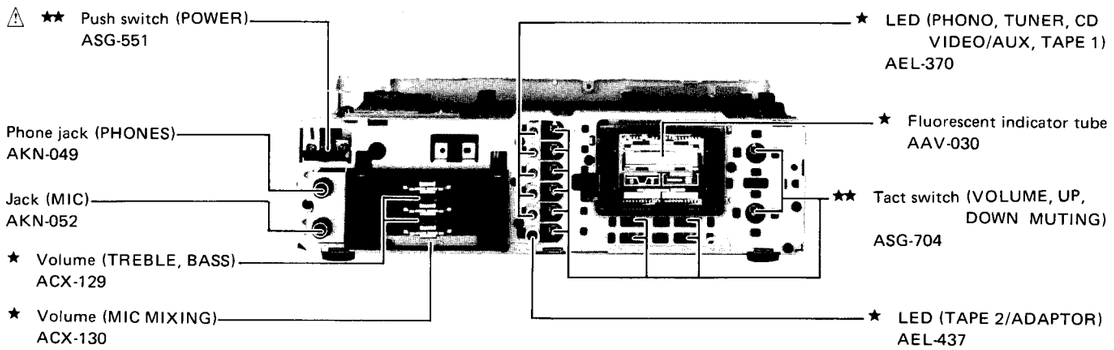
3. PARTS LOCATION

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

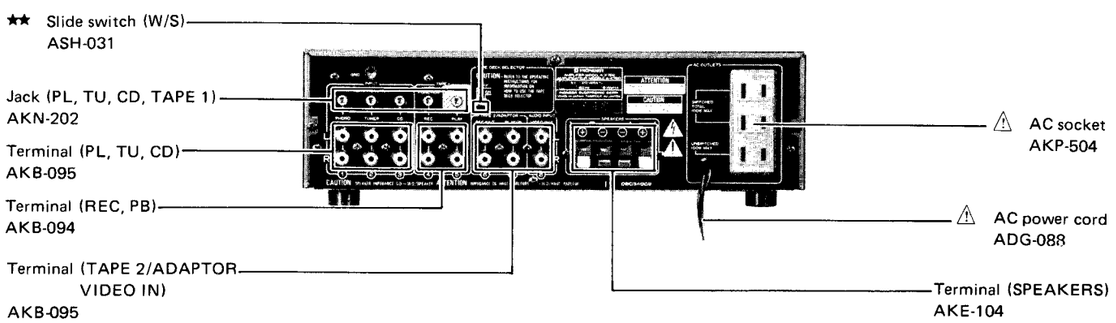
Front Panel View



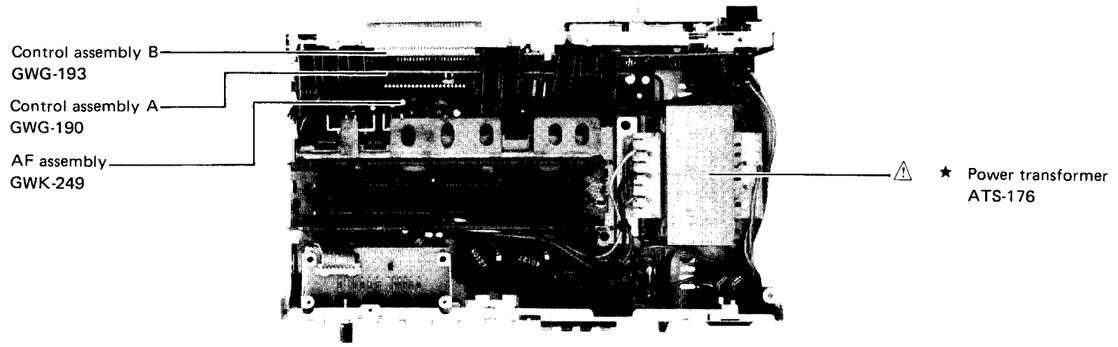
Front View with Panel Removed



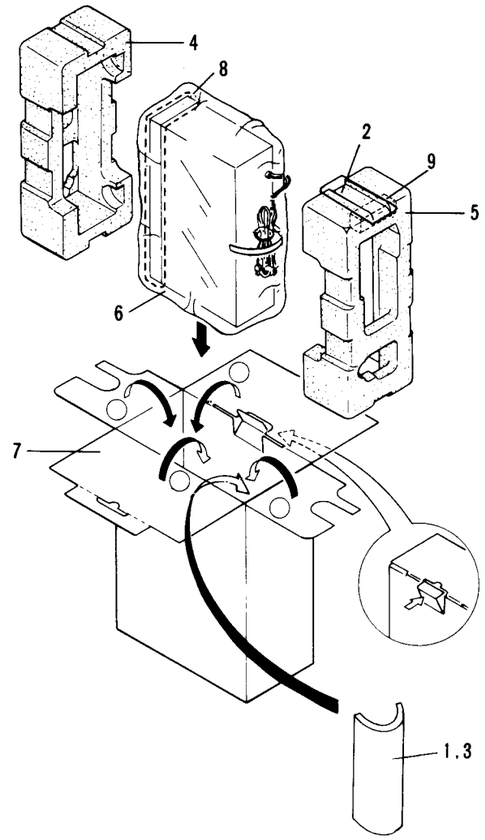
Rear Panel View



Top View

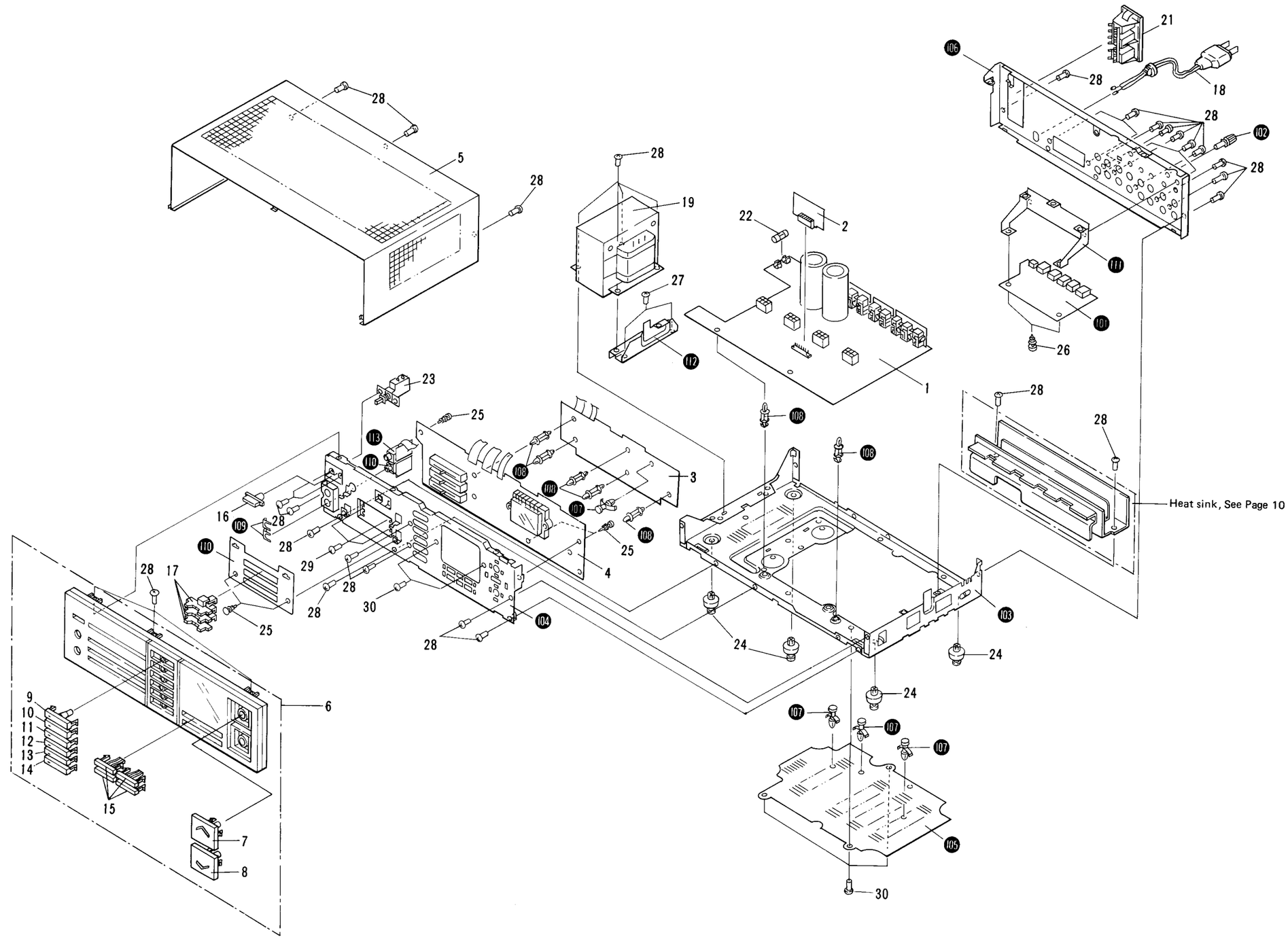


4. PACKING



Mark	No.	Part No.	Description
	1	ARB-647	Operating instructions
	2	AHG-117	Vinyl pouch
	3	ARH-070	Sub instruction manual
	4	AHA-324	Front pad
	5	AHA-325	Rear pad
	6	AHG-125	Sheet
	7	AHE-478	Packing case assembly
	8	AHG-128	Sheet
	9	AHB-131	Pad

5. EXPLODED VIEWS AND PARTS LIST



- *Parts without part number cannot be supplied.*
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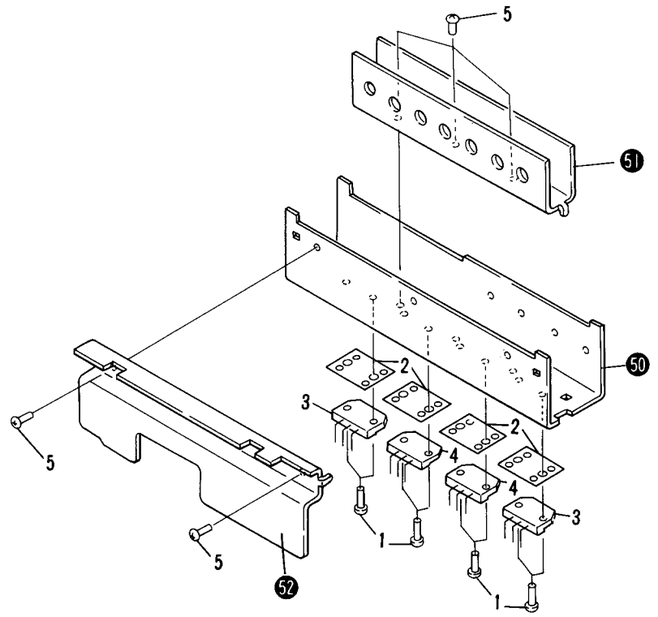
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark		No.	Part No.	Description
		1	GWK-249	AF assembly
		2	GWY-156	Driver assembly
		3	GWG-190	Control assembly A
		4	GWG-193	Control assembly B
		5	ANE-512	Bonnet case
		6	ANM-737	Front panel assembly
		7	AAY-018	Push knob VR1(VOLUME UP)
		8	AAY-019	Push knob VR2(VOLUME DOWN)
		9	AAY-010	Push knob PH (PHONO)
		10	AAY-011	Push knob TU (TUNER)
		11	AAY-012	Push knob CD (CD)
		12	AAY-013	Push knob VA (VIDEO/AUX)
		13	AAY-014	Push knob T1 (TAPE 1)
		14	AAY-015	Push knob T2 (TAPE 2)
		15	AAD-957	Push knob S
		16	AAD-995	Power knob (POWER)
		17	AAY-040	Slide knob
⚠		18	ADG-088	AC Power cord
⚠	★	19	ATS-176	Power transformer (120V)
		20	. . . . .	. . . . .
⚠		21	AKP-504	AC socket
⚠	★★	22	AEK-125	Fuse (FU1)
⚠	★★	23	ASG-551	Push switch (S1)
		24	AEP-016	Leg assembly
		25	AEC-471	Rivet
		26	AEC-510	Rivet
		27	BBZ30P080FMC	Screw (3x8)
		28	VBZ30P080FZK	Screw (3x8)
		29	PMZ20P030FZK	Screw (2x3)
		30	VMZ30P060FMC	Screw (3x6)

Mark		No.	Part No.	Description
		100		Jack assembly (MIC)
		101		Mini Jack assembly
		102		Terminal (GND)
		103		Chassis
		104		Panel stay
		105		Bottom plate
		106		Rear panel
		107		Print spacer
		108		PCB holder
		109		Mount plate
		110		Blind sheet
		111		PCB holder A
		112		PCB holder B
		113		Headphone assembly

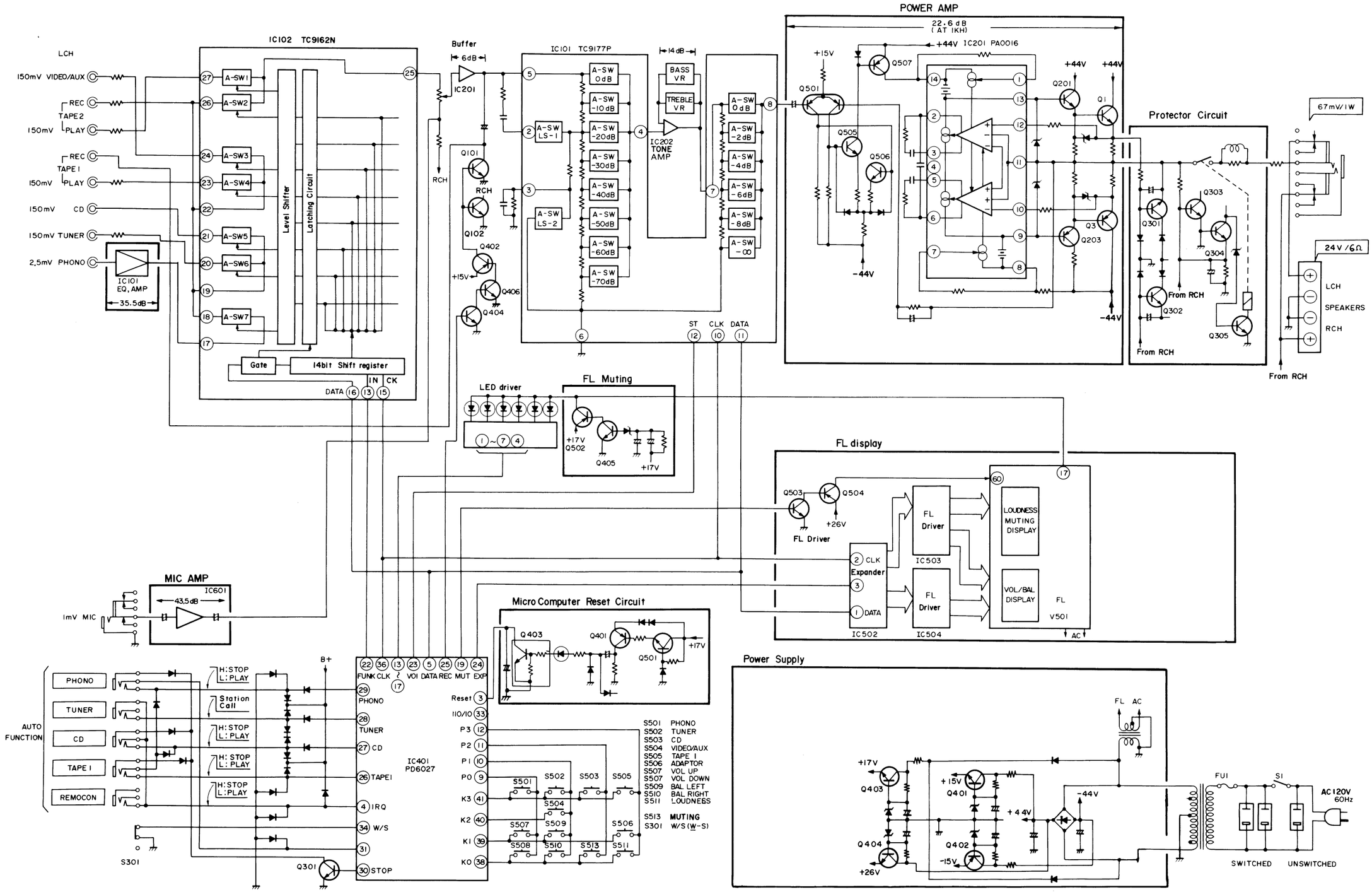
Heat Sink



Mark		No.	Part No.	Description
		1	ABA-258	Screw
		2	AEC-942	Mica sheet
★★		3	2SA1216(A)-G/P/Y*	Q2, Q4, Power transistor
★★		4	2SC2922(A)-G/P/Y*	Q1, Q3, Power transistor
		5	BBZ30P080FZK	Screw
		50		Heat sink
		51		Sub heat sink B
		52		Sub heat sink A

*hfe of Q1—Q4 should have the same value.

6. BLOCK DIAGRAM



7. CIRCUIT DESCRIPTIONS

Function Switching

If one of the switches S501 thru S506 in Fig. 7.6 is pressed, the PD6027 microcomputer (IC401) detects which switch has been pressed, and by controlling the TC9162N electronic switch (IC102), switches the unit to the selected function.

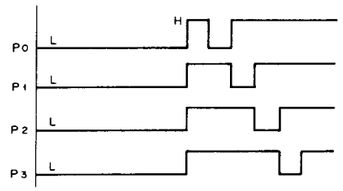


Fig. 7-1

Key scanning is started only when one of the keys in the matrix is pressed. P0 thru P3 are all at L level before any key is pressed, but are switched to H level once a key is pressed. At the same time, a microcomputer reads which key has been pressed at K0 thru K3, and then decides whether the pressed key is a function key or a volume key. If a function key, the current function position is compared with the pressed function. If this comparison shows that the two are different functions, function data corresponding to the pressed key is passed to the TC9162N. The configuration of this data is outlined in Fig. 7.2.

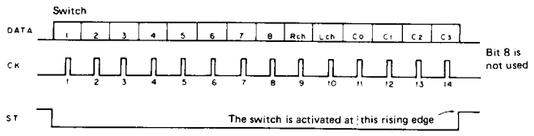


Fig. 7-2

The data consists of 14 bits with bits 1 thru 7 corresponding to PHONO, TUNER, CD, etc., and the bit for the switch to be switched on is switched to H level. Bits 9 and 10 are the left and right channel selector bits, while bits 11 thru 14 are TC9162N code bits.

Volume Control

Volume control operations involve the use of a microcomputer (IC401) combined with the TC9177P electronic volume control (IC101) as indicated in Fig. 7.7.

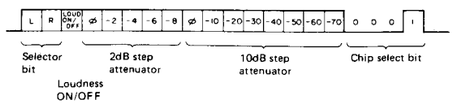


Fig. 7-3

20-Bit serial data corresponding to the pressed key and the current volume level is passed from the microcomputer for both left and right channels in that order. TC9177P (IC101) stores the 20 bits of data in a 20-bit shift register, and then activates each switch by strobe signal to achieve the selected degree of attenuation.

If bit 3 of the data is switched to H level, LS-1 is switched on and LS-2 is switched off resulting in the loudness being switched on to achieve a loudness effect if the volume level is less than -20dB.

Muting

TC9177P (IC101) attenuation is changed by 20dB by data similar to the VR control data.

Volume UP & DOWN Switches

Pressing the UP (S507) or DOWN (S508) switch continuously results in continuous volume changes. The DOWN switch, however, is set to change the volume at a faster rate.

The volume level can be controlled in 2dB steps from 0dB to 76dB, and down to — infinity in 40 steps.

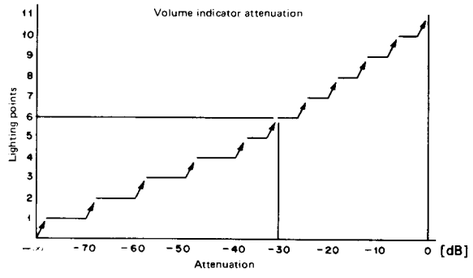


Fig. 7-4

L and R Balance Switches

Pressing the L (S509) or R (S510) balance switch once results in the display being switched to a balance display. Pressing either switch continuously results in continuous switching operation, and pressing both together results in the balance being set to center.

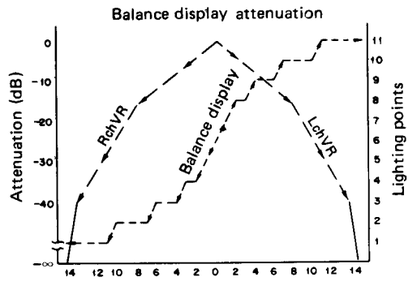


Fig. 7-5

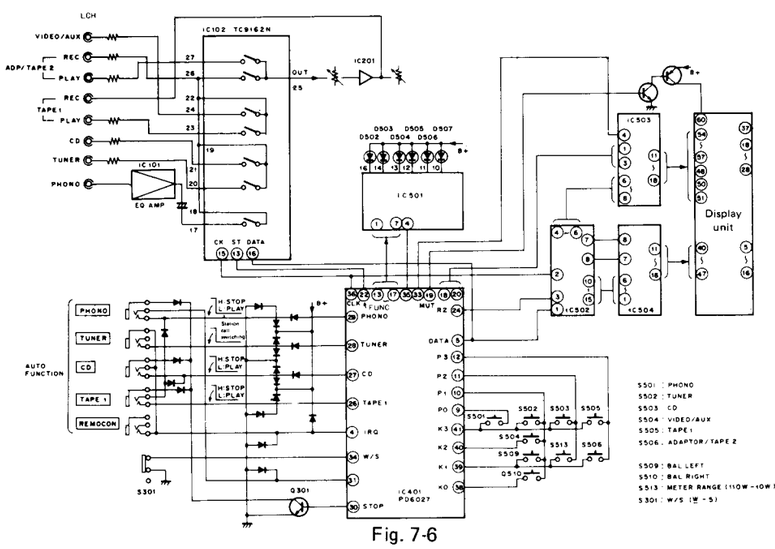


Fig. 7-6

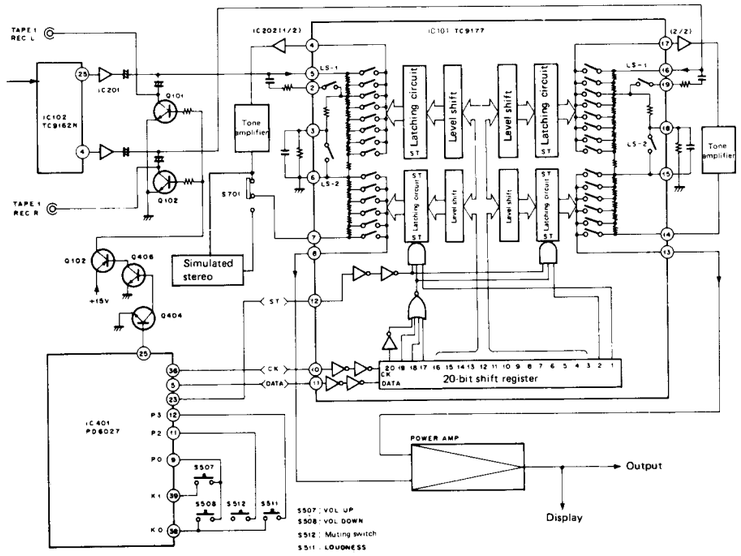


Fig. 7-7

Automatic Function Switching

If audio components featuring "one-touch autoplay" functions are connected to the relevant PHONO (PL), TUNER (TX), CD, or TAPE1(CT) "AUTO FUNCTION" terminal on the rear panel of the A—X700, the function is switched automatically to the operated component.

When the PLAY or STATION CALL switch of the component connected to the PHONO, TUNER, CD, or TAPE1 terminal is switched on, the generated L level signal is passed to the microcomputer which in turn passes corresponding data to the function switch (TC9162N) to effect the actual switching operation.

Stop Signal

When a function is switched by automatic function switching or amplifier function switching, an H level signal is generated at pin 30 of the microcomputer. Q301 is thus turned on, and auto stop output signals are passed to PL, CD, and CT.

Double Deck and Single Deck Switching

S301 is switched according to whether the tape deck connected to TAPE1 is a double or single deck. When a double deck is used, S301 is switched on resulting in pin 25 of the microcomputer remaining at H level. Q404 is thus turned on, and Q406 then Q102 are turned off. When Q101 and Q102 are both turned off, REC1 is switched on.

When S301 is off, pin 25 of the microcomputer is switched to H or L level depending on whether or not function has been switched to TAPE1. If the function has been switched to TAPE1, pin 25 is switched to L level, resulting in Q101 and Q102 being turned on and REC1 being switched off. When the function is switched to other positions, the reverse occurs.

Remote Control Terminal

The photosensitive section of the remote control mechanism is located in the tuner. Upon reception of a remote control signal in the tuner, a VR UP, DOWN, muting, VIDEO/AUX, or tuntable start/stop signal is decoded by the microcomputer. Remote control signals for CD or TAPE1 are passed direct from the tuner.

Microcomputer Reset Circuit

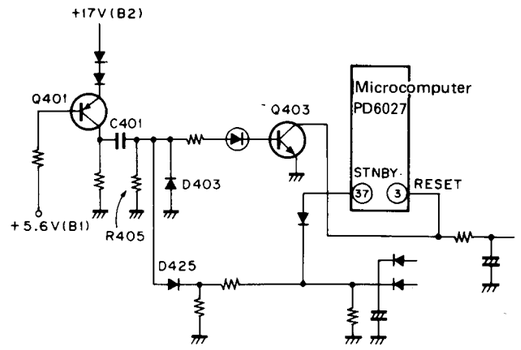


Fig. 7-8

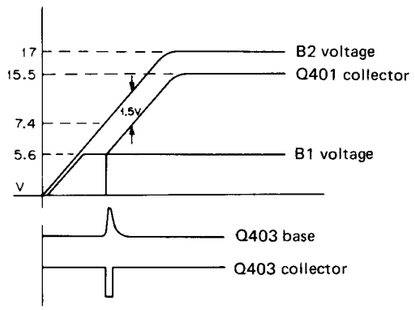


Fig. 7-8-1

The microcomputer reset circuit is outlined in Fig. 7.7.

When the power is switched on, and the Q401 base voltage (B_1) is increased to 5.6V with the emitter voltage (B_2) in excess of 7.4V, Q401 is turned on and the collector voltage is gradually increased to 15.5V. The Q401 output is differentiated by C401/R405 and then inverted by Q403 to obtain the reset signal.

D425 has been inserted in the circuit to prevent Q403 cut-off at the same time the power is switched off in order to prevent the memory from being switched off by reset circuit misoperation if the power switch is switched on and off in quick succession. The reset signal resets the microcomputer once clock oscillation (3.84 MHz) has been commenced when the STANDBY pin (No.37) voltage is increased after the power is switched on.

PD6027 Functions

Pin No.	Pin Name	Function		Active
1	EX	3.84 MHz resonator is connected between these pins.		
2	X			
3	RESET	Positive power supply (VDD) connection		L
4	IRQ	Remote control signal input		L
5	SO	Serial data output to PD0012, TC9177P, and TC9162N.		
6	SI	NC		
7	SC/TO			
8	TC			
9	P_ϕ	Output of key matrix drive signals		L
10	P_1			L
11	P_2			L
12	P_3			L
13	O_ϕ	Indicator outputs	TAPE 1	H
14	O_1		CD	H
15	O_2		TUNER	H
16	O_3		PHONO	H
17	O_4		TAPE 2	H
18	O_5		LOUDNESS	H
19	O_6		MUTING	H
20	O_7		BARANCE	H
21	V_{SS}	GND		
22	R_ϕ	Strobe outputs	TC9162N	L
23	R_1		TC9177P	L
24	R_2		PD0012	L
25*	R_3	REC OUT switch (output switched on)		H
26	R_4	Auto function input	TAPE 1	L
27	R_5		CD	L
28	R_6		TUNER	L
29	R_7		PHONO	L
30*	R_8	Output of auto stop signals		H
31	R_9	Output of turntable remote control signal		L
32	R_ϕ	Indicator outputs	VOLUME	H
33	R_{11}		110W meter range	H
34	R_{12}	Double cassette deck selector input		L
35	R_{13}	Indicator output VIDEO/AUX		H
36	R_{14}	Serial data clock		
37	STBY	Back-up mode starter input		L
38	K_ϕ	Key inputs		L
39	K_1			L
40	K_2			L
41	K_3			L
42	VDD	5 V		

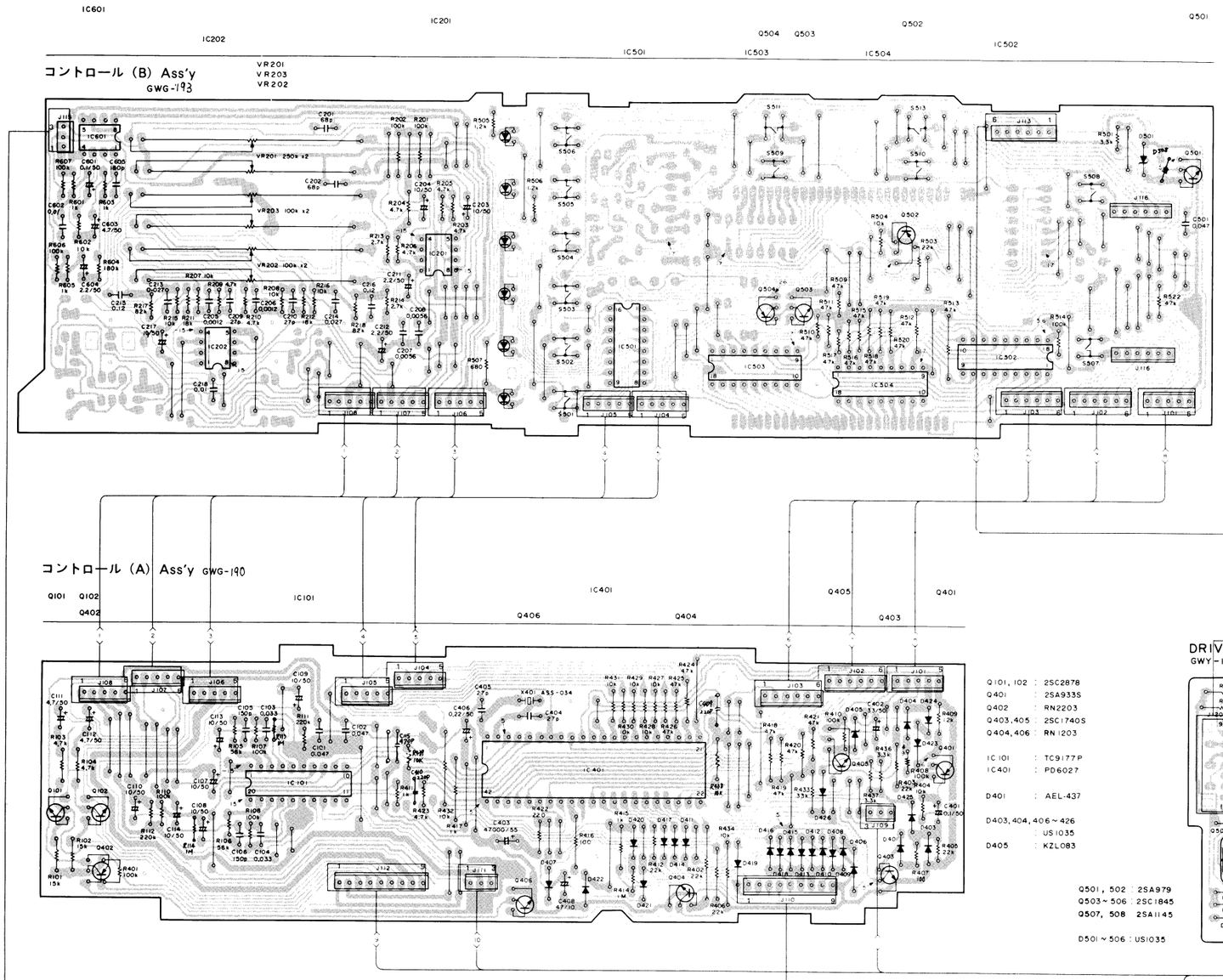
***Pin No. 25.**

The R12 pin is at H level. Pin 25 is switched to L level when TAPE1 function is selected, but is switched to H level in other function positions, and R12 remains at H level.

***Pin No. 30**

Switched to H level for 100msec immediately following function switching.

8. P.C. BOARDS CONNECTION DIAGRAM

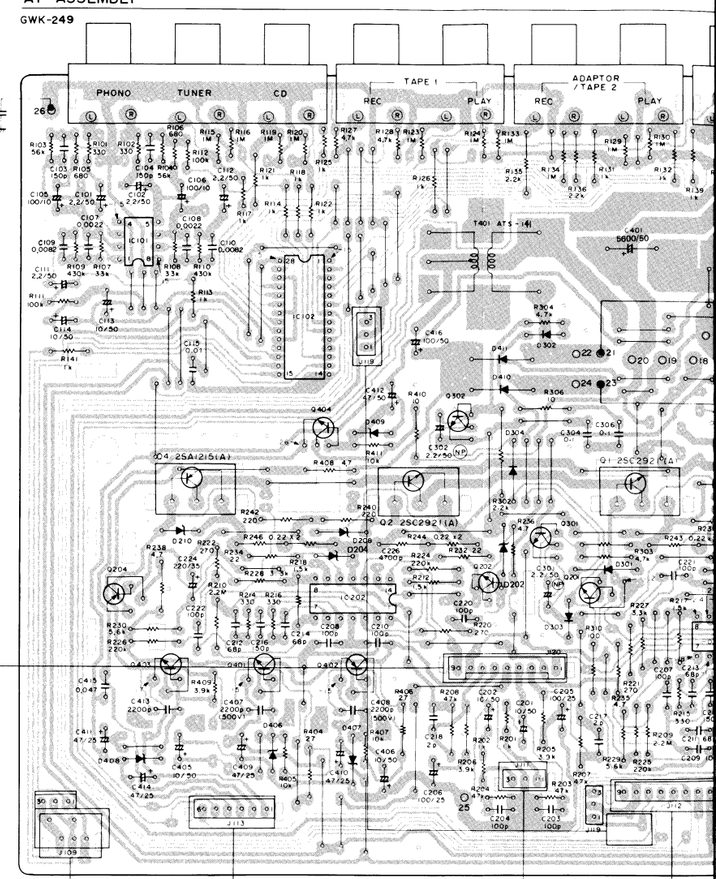


Q501	: 2SD438
Q502	: 2SA1115
Q503	: RN1203
Q504	: RN2203
IC201, 202, 601	: NJM4558DXC
IC501	: TD62504P
IC502	: PD0012
IC503, 504	: M54562P
D501	: KZL061
D502	: AEL-404
D503~507, 702	: AEL-370
D701	: RD15EB
D508	: 1SS131
VR201	: ACX-130
VR202, 203	: ACX-129
VR801, 802	: VRTB6VS222
S501~511, 513	: ASG-704

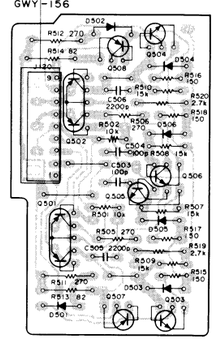
Q101, 102	: 2SC2878
Q401	: 2SA933S
Q402	: RN2203
Q403, 405	: 2SC1740S
Q404, 406	: RN1203
IC101	: TC9177P
IC401	: PD6027
D401	: AEL-437
D403, 404, 406~426	: US1035
D405	: KZL083

Q301	: 2SC1740S
D301~305	: US1035
S301	: ASH-031

AF ASSEMBLY
GWK-249

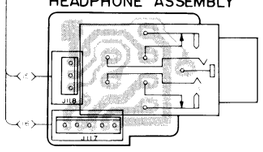


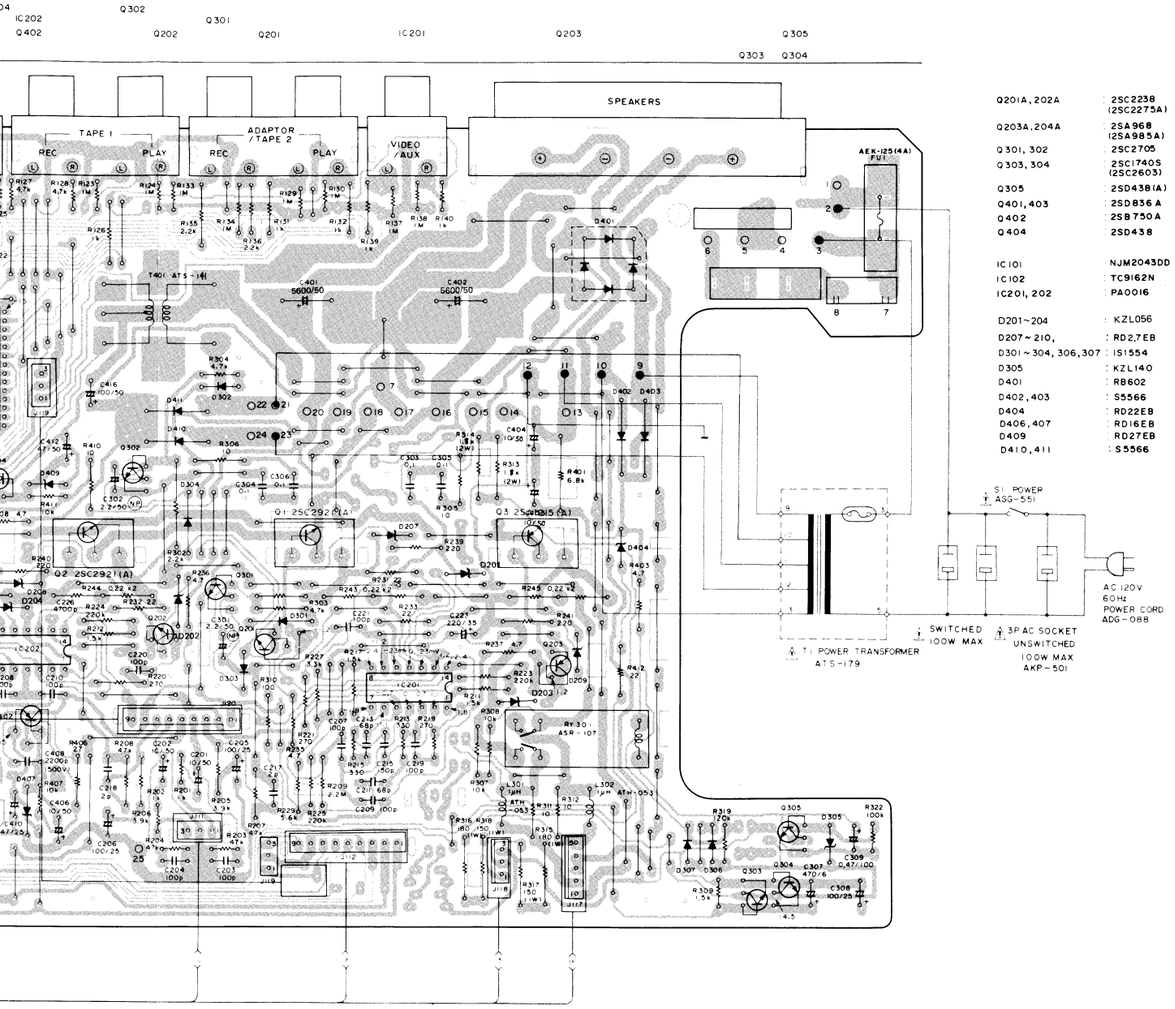
DRIVER ASSEMBLY
GWY-156



Q501, 502	: 2SA979
Q503~506	: 2SC1845
Q507, 508	: 2SA1145
D501~506	: US1035

HEADPHONE ASSEMBLY

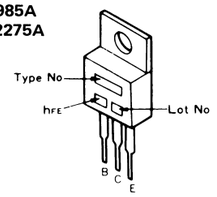




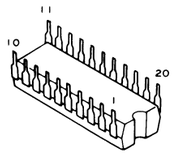
Q201A, 202A	: 2SC2238 (2SC2275A)
Q203A, 204A	: 2SA968 (2SA985A)
Q301, 302	: 2SC2705
Q303, 304	: 2SC1740S (2SC2603)
Q305	: 2SD438(A)
Q401, 403	: 2SD836A
Q402	: 2SB750A
Q404	: 2SD438
IC101	: NJM2043DD
IC102	: TC9162N
IC201, 202	: PA0016
D201~204	: KZL056
D207~210,	: RD2.7EB
D301~304, 306, 307	: IS1554
D305	: KZL140
D401	: RB602
D402, 403	: S5566
D404	: RD22EB
D406, 407	: RD16EB
D409	: RD27EB
D410, 411	: S5566

External Appearance of Transistors and ICs

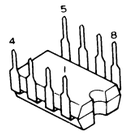
2SA985A
2SC2275A



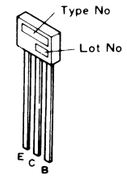
TC9177P



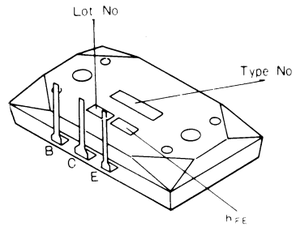
NJM4558DXC
NJM2043DD



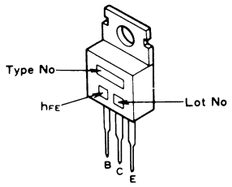
RN1203
RN2203



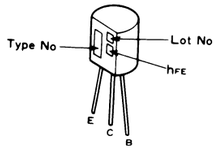
2SC2922(A)G/P/Y
2SA1216(A)G/P/Y



2SA968-O/Y
2SB750A
2SC2238-O/Y
2SD836A



2SC2705
2SA1145
2SC2878



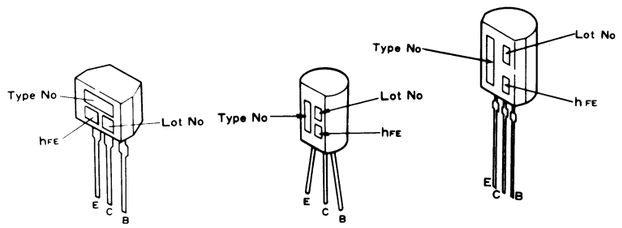
2SC1740S
2SA933S

2SC1845

2SD438

2SA979

2SA1115
2SC2603



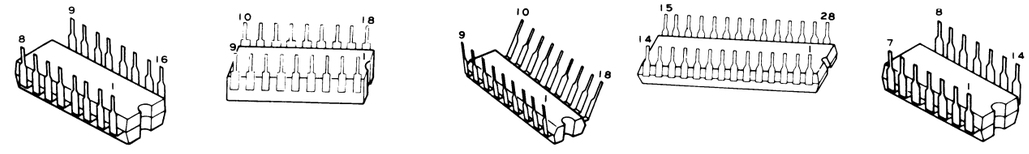
TD62504P

PD0012

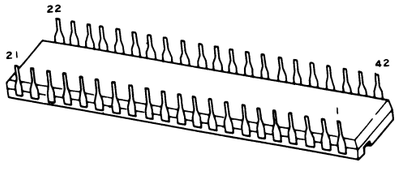
M54562P

TC9162N

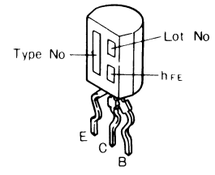
PA0016



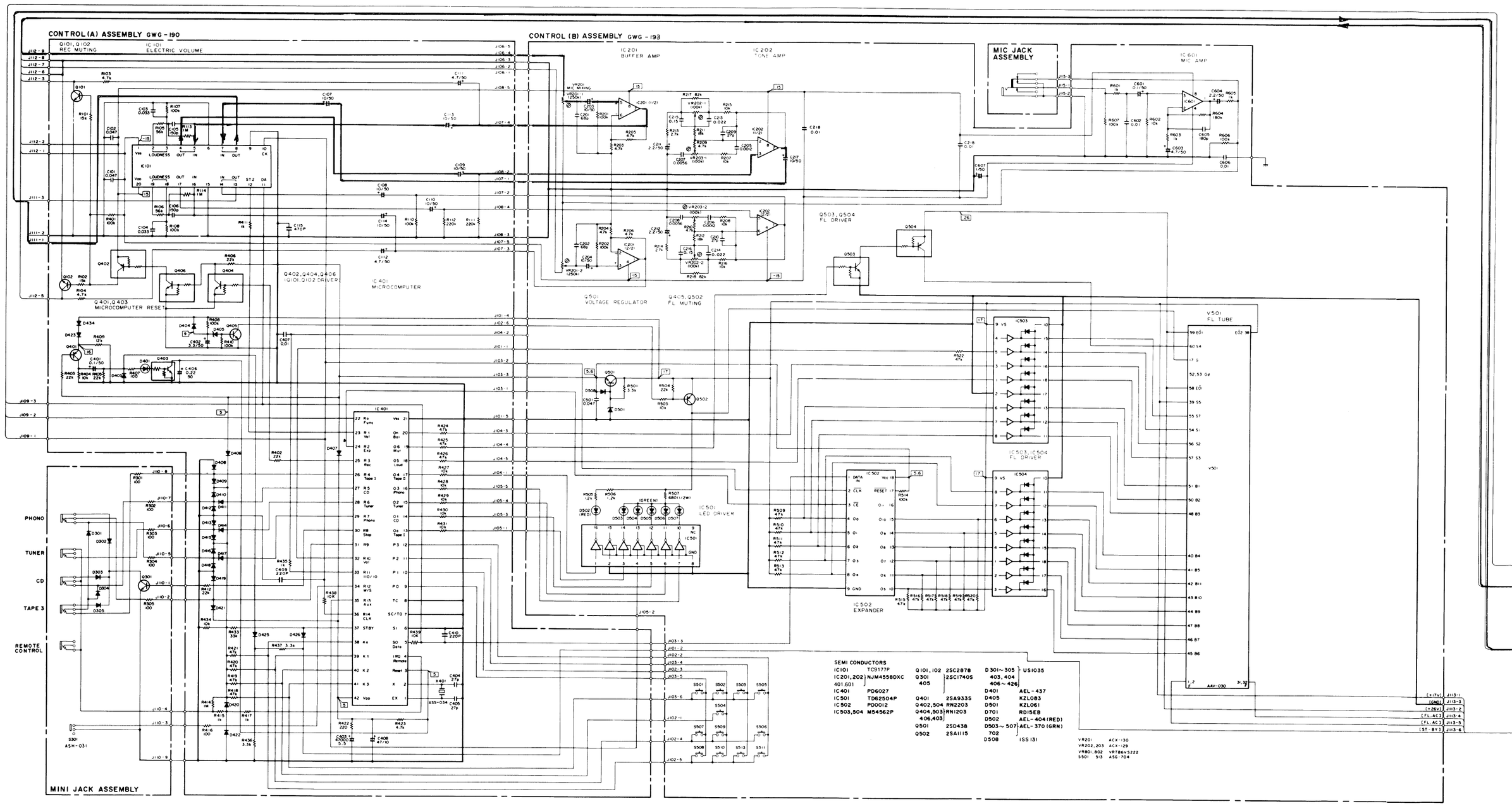
PD6027

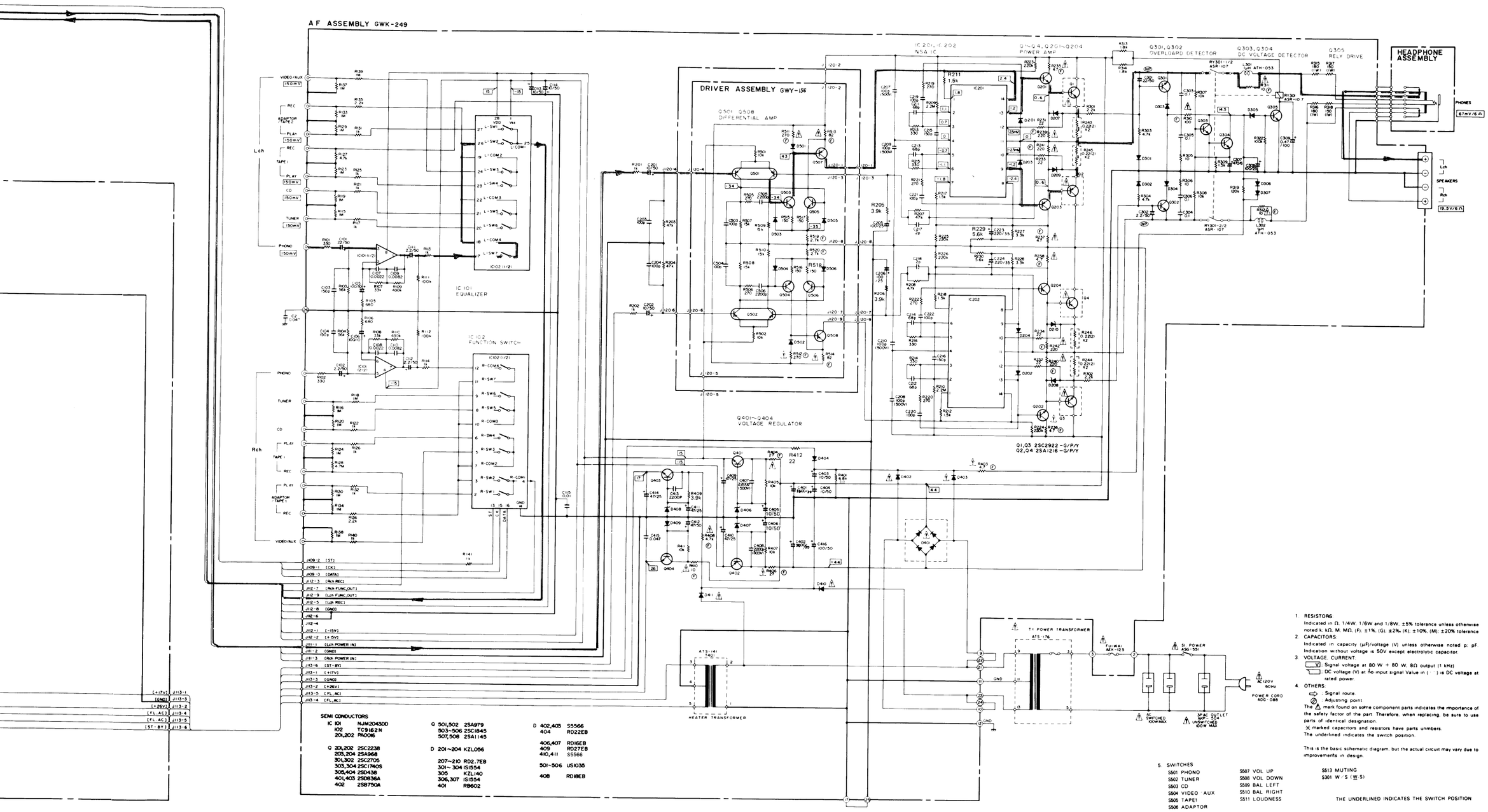


2SD438(A)-F



9. SCHEMATIC DIAGRAM





SEMI CONDUCTORS

IC 101	NJM4203D	Q 501,502	2SA979	D 402,403	S5566
102	TC9162N	503~506	2SC1845	404	RD22EB
201,202	PA0016	507,508	2SA1145	405,407	RD16EB
Q 201,202	2SC2238	D 201~204	KZL056	409	RD27EB
203,204	2SA968	207~210	RD2.7EB	410,411	S5566
301,302	2SC2705	301~304	ISI554	501~506	US1035
303,304	2SC1740S	305	KZL140	408	RD18EB
305,404	2SD438	306,307	ISI554		
401,403	2SD836A	401	RB602		
402	2SB750A				

1. RESISTORS:
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k, kΩ, M, MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
(V): Signal voltage at 80 W + 80 W, 8Ω output (1 kHz)
(): DC voltage (V) at no input signal Value in [ ] is DC voltage at rated power.
4. OTHERS:
⇨ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
✕ marked capacitors and resistors have parts unmbers.
The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES

S501	PHONO	S507	VOL UP
S502	TUNER	S508	VOL DOWN
S503	CD	S509	BAL LEFT
S504	VIDEO AUX	S510	BAL RIGHT
S505	TAPE1	S511	LOUDNESS
S506	ADAPTOR		

S513 MUTING
S301 W·S (W·S)

THE UNDERLINED INDICATES THE SWITCH POSITION

10. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).
  560Ω 56 x 10¹ 561 ..... RD¼PS 5 6 1 J
  47kΩ 47 x 10³ 473 ..... RD¼PS 4 7 3 J
  0.5Ω 0R5 ..... RN2H 0 R 5 K
  1Ω 010 ..... RS1P 0 1 0 K
  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
  5.62kΩ 562 x 10¹ 5621 ..... RN¼SR 5 6 2 1 F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

P.C.B. ASSEMBLIES

Mark	Symbol & Description	Part No.
	AF Assembly	GWK-249
	Driver Assembly	GWY-156
	Control Assembly A	GWG-190
	Control Assembly B	GWG-193
	Microphone Jack Assembly	
	Mini-jack Assembly	
	Headphones Assembly	

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠ ★★	Q1, Q3	2SC2922(A)-G/P/Y*
⚠ ★★	Q2, Q4	2SA1216(A)-G/P/Y*

*hfe of Q1–Q4 should have the same value.

OTHERS

Mark	Symbol & Description	Part No.
⚠	C2 Ceramic Capacitor	CKDYF473Z 50
⚠ ★	Power Transformer	ATS-176
⚠	AC socket	AKP-504
⚠ ★★	Push Switch	ASG-551
⚠ ★★	FU1 Fuse (4A)	AEK-125
⚠	AC power cord	ADG-088
	Mica Sheet	AEC-942

AF Assembly (GWK-249)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	NJM2043DD
★★	IC201, IC202	PA0016
★★	IC102	TC9162N
★★	Q203, Q204	2SA968–O/Y* (2SA985(A))
★★	Q402	2SB750A
★★	Q303, Q304	2SC1740S (2SC2603)
★★	Q201, Q202	2SC2238–O/Y* (2SC2275A)
★★	Q301, Q302	2SC2705
★★	Q305	2SD438(A)–F
★★	Q404	2SD438
★★	Q401, Q403	2SD836A
★	D201 – D204	KZL056
★	D305	KZL140
★	D401	RB602
★	D406, D407	RD16EB (HZ16EB)
★	D408	RD18EB (HZ18EB)
★	D207 – D210	RD2.7EB (HZ2.7EB)
★	D404	RD22EB (HZ22EB)
★	D409	RD27EB (HZ27EB)
★	D402, D403, D410, D411	S5566 (11E2)
★	D301–D304, D306, D307	1S1554

*hfe of Q201–Q204 should have the same value.

COILS & TRANSFORMER

Mark	Symbol & Description	Part No.
	L301, L302 (1μH)	ATH-053
⚠ ★	T401 (Heater transformer)	ATS-141

RELAY

Mark	Symbol & Description	Part No.
	RY301	ASR-107 (ASR-109)

CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C402 (5600/50V)	ACH-244
	C203, C204, C219 – C222	CCDSL 101J 50
	C207 – C210	CCDSL 101K 500
	C103, C104, C215, C216	CCDSL 151J 50
	C211 – C214	CCDSL 680J 50
	C301, C302	CEANP 2R2M 50
	C309	CEAR 47M 100L
	C223, C224	CEAS 221M 35
	C403, C404, C201, C202	CEA 100M 50L
	C113, C114, C405, C406	
	C105, C106	CEA 101M 10L
	C308	CEA 101M 25L
	C416	CEA 101M 50L
	C111, C112	CEA 2R2M 50L
	C409 – C411, C414	CEA 470M 25L
	C412	CEA 470M 50L
	C307	CEA 471M 6L
	C101, C102	CEXA 2R2M 50
	C205, C206	CEXA 101M 25
	C407, C408, C413	CKDYB 222K 50
	C415	CKDYF 473Z 50
	C217, C218	CMA020D 500
	C303 – C306	CQMA 104K 50
	C107, C108	CQMA 222J 50
	C109, C110	CQMA822J 50
	C115	CKDYF 103Z 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R243 – R246 (0.22 Ω 2W)	ACN-131
⚠	R404, R406	RD1/4PMFL 100J
⚠	R408	RD1/4PMFL4R7J
⚠	R311, R312, R410	RFA1/4PS100J
⚠	R310	RFA1/4PS101J
⚠	R239 – R242	RFA1/4PS221J
⚠	R235 – R238, R403	RFA1/4PS4R7J
	R317, R318	RS1PMF151J
	R315, R316	RS1PMF181J
	R313, R314	RS1PMF182J
	R401	RS1PMF682J
	R205 – R212, R317, R218, R227 – R234, R305, R306	RD1/4PM □□□J
	Resistors other than above.	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 4P (REC, PB)	AKB-094
	Terminal 6P	AKB-095
	Terminal 4P (SPEAKERS)	AKE-104
	Transistor Socket	AKH-017
	Screw	PBZ30P060FMC

Headphone Assembly

Mark	Symbol & Description	Part No.
	Headphone Jack	AKN-049

Driver Assembly (GWY-156)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q507, Q508	2SA1145
★★	Q501, Q502	2SA979
★★	Q503 – Q506	2SC1845
★	D501 – D506	US1035

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504	CMA 101J 500
	C505, C506	CQMA 222J 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R519, R520	RD1/4PMFL 272J
	R511, R512	RFA1/4PS 271J
	R513, R514	RFA1/4PS 820J
	Resistors other than above.	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	9P Socket	AKP-046

Control Assembly (GWG-190)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC401	PD6027
★★	IC101	TC9177P
★★	Q404, Q406, Q403	RN1203
★★	Q402	RN2203
★★	Q401	2SA933S
★★	Q405	2SC1740S
★★	Q101, Q102	2SC2878
★	D401	AEL-437
★	D405	KZL083
★	D403, D404, D406 – D426	US1035 (1S1555)

CAPACITORS

Mark	Symbol & Description	Part No.
	C403	ACH-902
	C404, C405	CCDCH 270J 50
	C105, C106	CCDSL 151J 50
	C406	CEAR 22M 50L
	C401	CEAR 22M 50L
	C107 – C110, C113, C114	CEA 100M 50L
	C402	CEA 3R3M 50L
	C111, C112	CEA 4R7M 50L
	C408	CEA 470M 10L
	C101, C102	CKDYF 473Z 50
	C103, C104	CQMA 333K 50
	C404, C419	CCDSL 221J 50
	C115	CKDYB 471K 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	X401 (Resonator)	ASS-034

Control Assembly B (GWG-193)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC503, IC504	M54562P
★★	IC201, IC202, IC601	NJM4558DXC
★★	IC502	PD0012
★★	IC501	TD62504P
★★	Q503	RN1203
★★	Q504	RN2203
★★	Q502	2SA1115
★★	Q501	2SD438
★	D503 – D507	AEL-370
★	D502	AEL-404
	D508	1SS131
★	D501	KZL061

SWITCHES

Mark	Symbol & Description	Part No.
★★	S501 – S511, S513 (Tact switch)	ASG-704

CAPACITORS

Mark	Symbol & Description	Part No.
	C209, C210	CCDSL 270J 50
	C201, C202	CCDSL 680J 50
	C601	CEJANL 0R1M 50
	C604	CEJANL 2R2M 50
	C603	CEJANL 4R7M 50
	C607	CEA010M 50L
	C203, C204	CEA 100M 50L
	C218, C605	CKDYF103Z50
	C501	CKDYX473M25
	C205, C206	CQMA122K50
	C215, C216	CQMA154K50
	C213, C214	CQMA223K50
	C602	CQMA393K50
	C207, C208	CQMA562K50
	C211, C212	CEA2R2M50L
	C217	CEA100M50L

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR202, VR203 (BASS, TREBLE)	ACX-129
★	VR201 (MIC-MIXING)	ACX-130
	R507	RD1/2PM681J
	R502	RFA1/4PS4R7J
	Resistors other than above.	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
★	V501(Fluorescent tube)	AAV-030

Microphone Jack Assembly

Mark	Symbol & Description	Part No.
	Microphone Jack	AKN-052

Mini-jack Assembly

SEMI-CONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q301	2SC1740S
★	D301 – D305	US1035

SWITCH

Mark	Symbol & Description	Part No.
★★	S301 Slide switch (W-S)	ASH-031

RESISTORS

Mark	Symbol & Description	Part No.
	R301 – R305	RD1/8 PM101J

OTHERS

Mark	Symbol & Description	Part No.
	Mini-jack	AKN-202

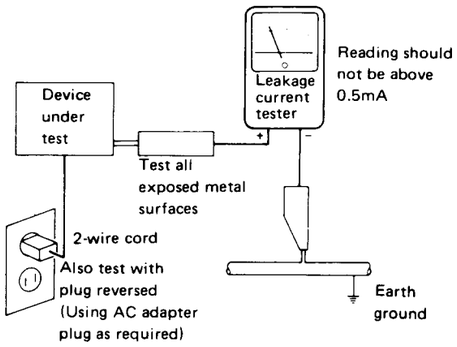
11. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

12. FOR HE TYPE

The HE type is the same as the KU type with the exception of the following section.

Contrast of Miscellaneous Parts

Mark	Symbol & Description		Part No. KU type	Part No. HE type	Remarks
	AF assembly		GWK-249	GWK-251	
	Driver assembly		GWY-156	GWY-194	
⚠ ★	T1 Power transformer	(120V)	ATS-176	.....	
		(220 V)	.....	ATS-178	
⚠	AC Socket		AKP-504	AKP-502	
⚠ ★★	S1 Push switch	(POWER)	ASG-551	ASG-552	
			(ASG-549)	(.....)	
⚠ ★★	FU1	(4A)	AEK-125	.....	
		(T2.5A)	.....	AEK-018	
⚠ ★★	FU2	(T1.25A)	.....	AEK-403	
⚠	Power cord		ADG-088	ADG-068	
	Operating instructions		ARB-647	.....	
		(English)			
	(English/French/German/Italian)		.....	ARE-122	
	Sub instructions		ARH-070	ARH-071	
	Packing case		AHE-478	AHE-479	

AF assembly (GWK-251)

The AF assembly (GWK-251) is same as the GWK-249 with the exception of the following sections.

Mark	Symbol & Description	Part No. GWK-249	Part No. GWK-251	Remarks
★	D201 – D204	KZL056	.....	
★	D404	RD22EB	RD18EB	
★	D413 – D415	.....	1SS131	
	C225, C226	.....	CQMA472K50	
	C302	CEANP2R2M50	ACH-383	
	C403, C404	CEA100M50L	ACH-390	
	C412	CEA470M50L	ACH-385	
	R247	.....	RD1/4PM102J	
	R248	.....	RD1/8PM102J	
	R249, R250	.....	RD1/8PM220J	
	R313, R314	RS1PMF182J	RS2LMF122J	
	R319	RD1/8PM124J	RD1/8PM104J	
	R323, R324	.....	RD1/8PM101J	
	R408	RD1/4PMFL4R7J	RFA1/4PS4R7J	
	R404, R406	RD1/4PMFL270J	RD1/4PMFL100J	
	R410	RFA1/4PS100J	RD1/4PM471J	
	R412	RD1/8PM220J	.....	
⚠ ★	T401 Heater transformer	ATS-141	ATS-180	

Driver assembly (GWY-194)

The driver assembly (GWY-194) is the same as the GWY-156 with the exception of the following sections.

Mark	Symbol & Description	Part No. GWY-156	Part No. GWY-194	Remarks
	R507 – R510	RD1/8PM153J	RD1/8PM223J	
⚠	R519, R520	RD1/4PMFL272J	RS2LMF682J	
	R511, R512	RFA1/4PS271J	RD1/4PM391J	
	R513, R514	RFA1/4PS820J	RD1/4PM820J	

Q501, 502 : 2SA979
Q503~506 : 2SC1845
Q507, 508 : 2SA1145

D501~506 : USI035

P.C. Board Pattern

marks

g sections.

marks

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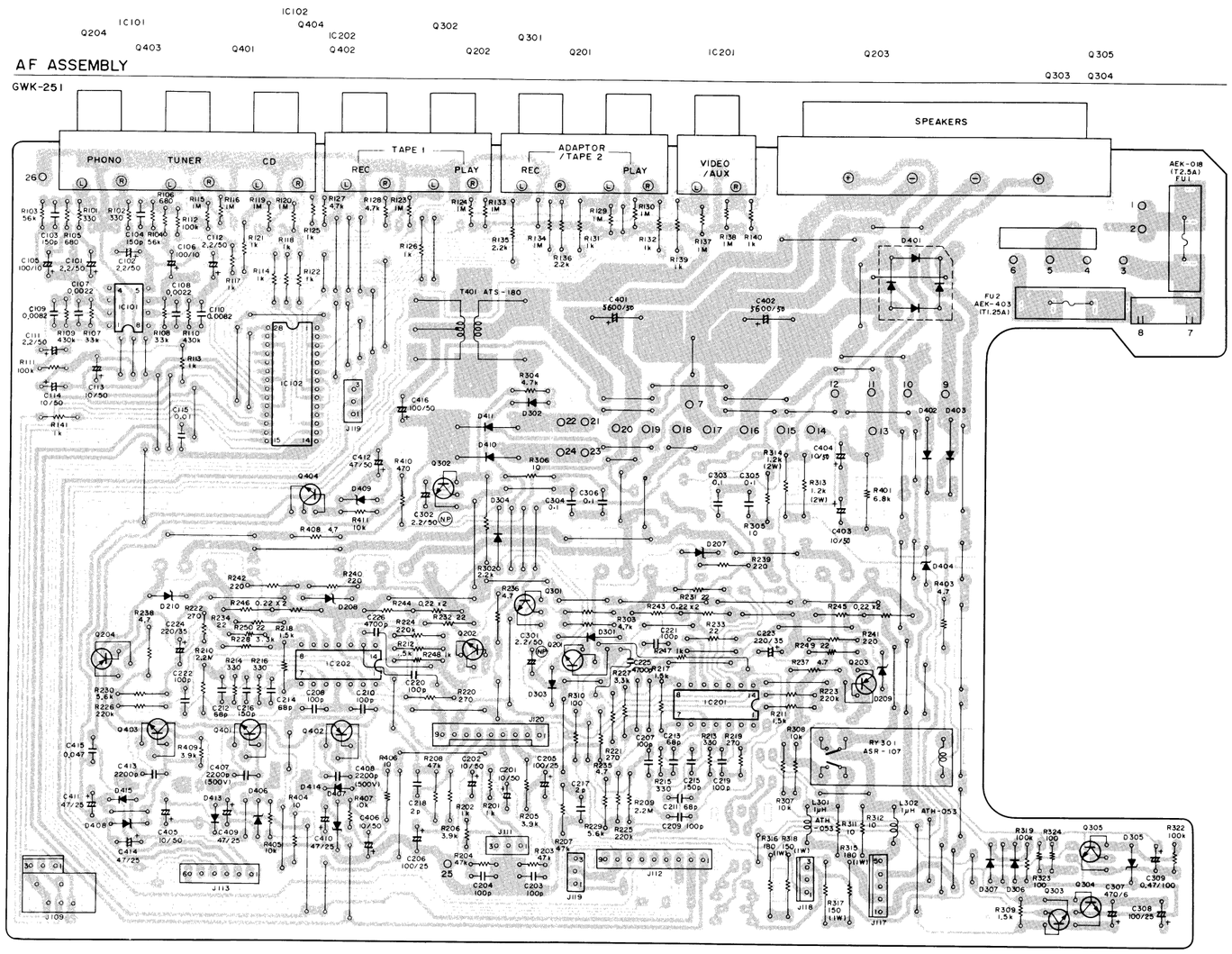
marks

AF ASSEMBLY

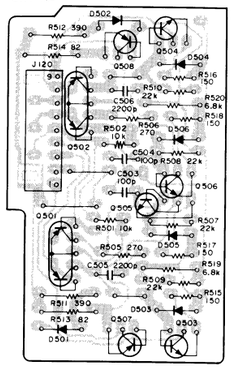
GWK-251



Q201A, 202A	: 2SC2238 (2SC2275A)
Q203A, 204A	: 2SA968 (2SA985A)
Q301, 302	: 2SC2705
Q303, 304	: 2SC1740S (2SC2603)
Q305	: 2SD438(A)
Q401, 403	: 2SD836 A
Q402	: 2SB750A
Q404	: 2SD438
IC101	: NJM2043DD
IC102	: TC9162N
IC201, 202	: PA0016
D207~210,	: RD2.7EB
D301~304, 306, 307	: IS1554
D305	: KZL140
D401	: RB602
D402, 403	: S5566
D404	: RD18EB
D406, 407	: RD16EB
D409	: RD27EB
D410, 411	: S5566
D413~415	: ISS131

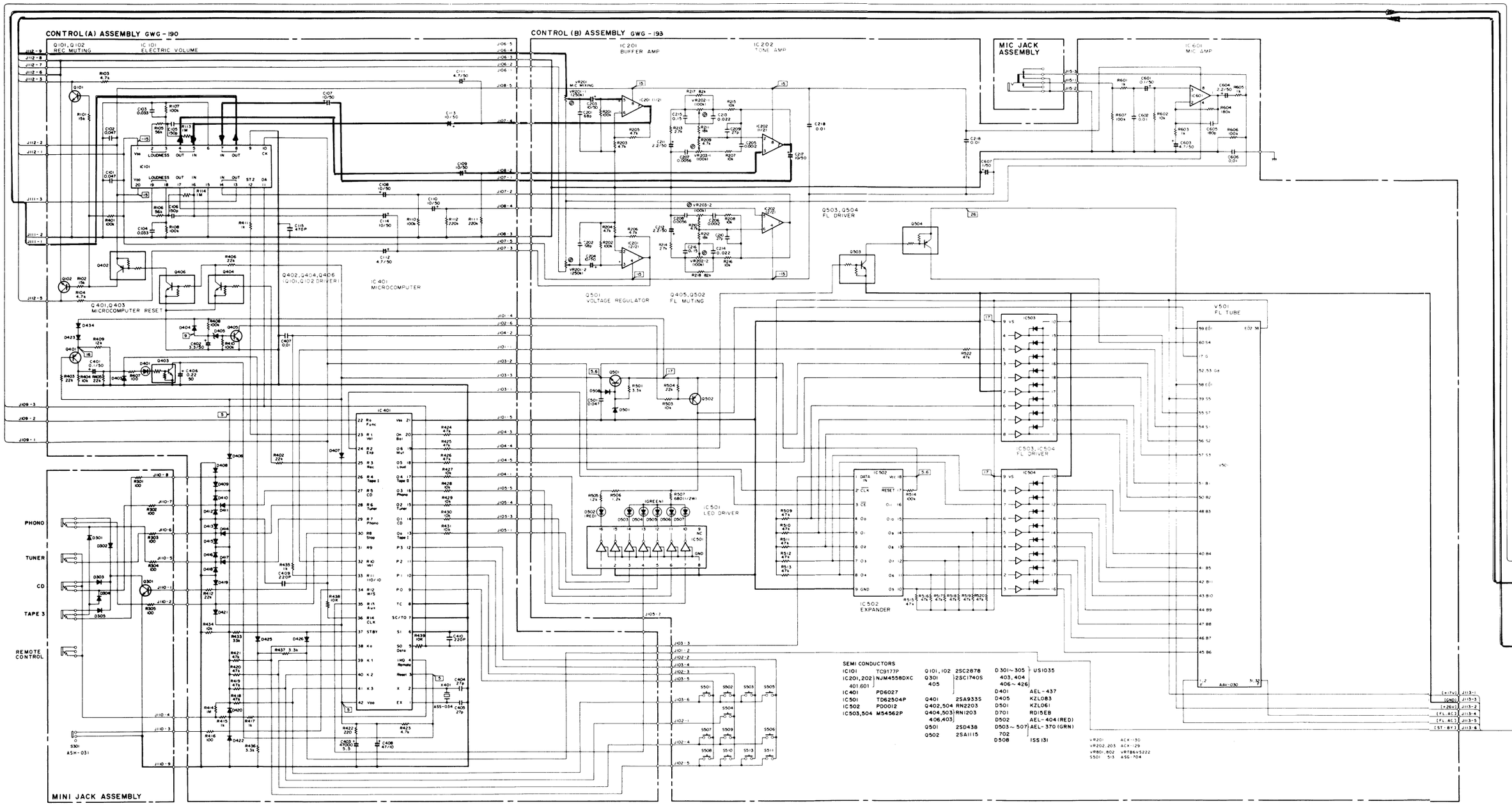
DRIVER ASSEMBLY

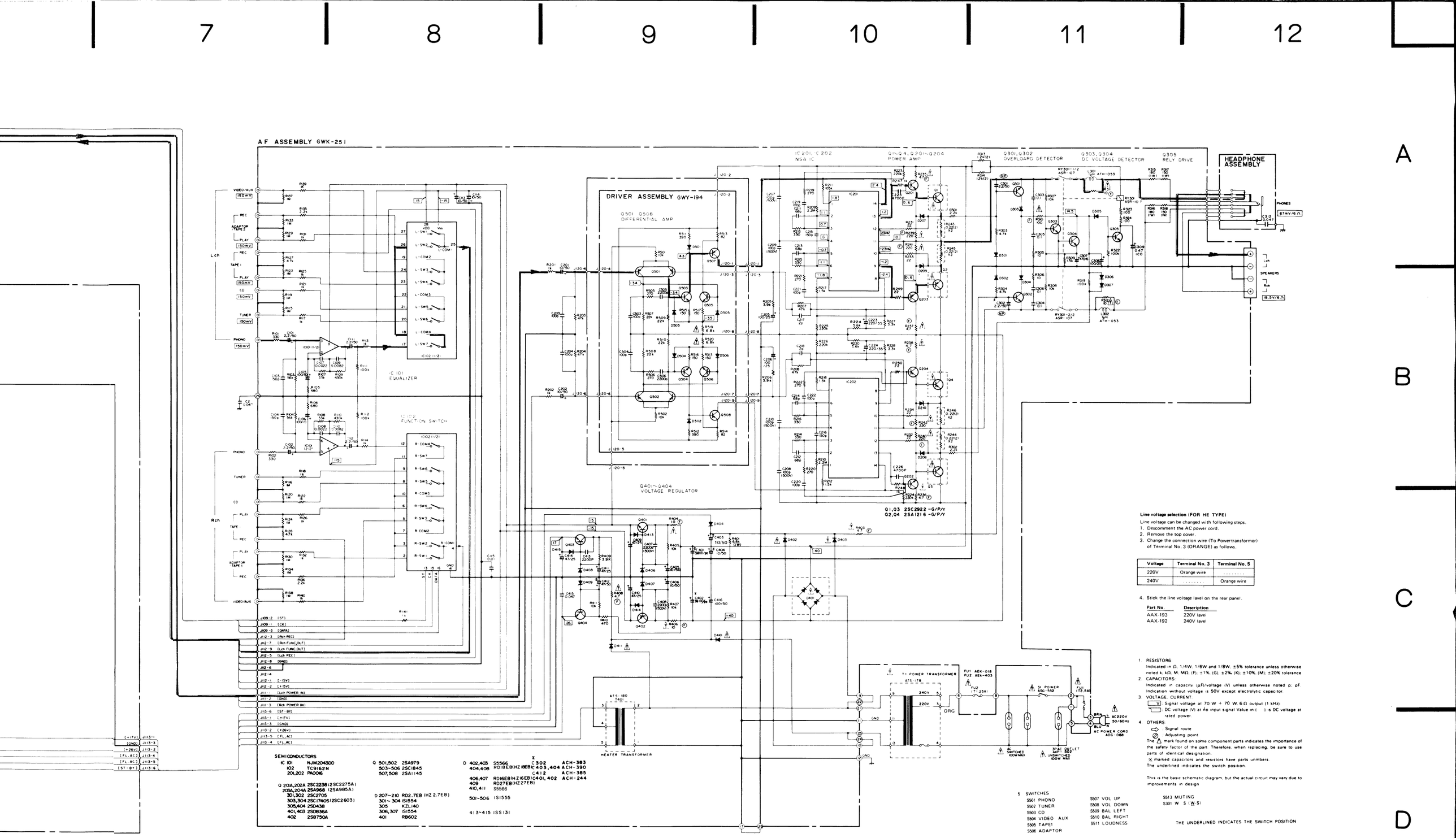
GWY-194



Q501, 502 : 2SA979
Q503~506 : 2SC1845
Q507, 508 2SA1145

D501~506 : US1035


CONTROL (A) ASSEMBLY GWG-190
CONTROL (B) ASSEMBLY GWG-193
Q101, Q102 REC MUTING
IC101 ELECTRIC VOLUME
IC201 BUFFER AMP
IC202 TONE AMP
MIC JACK ASSEMBLY
IC601 MIC AMP
Q402, Q404, Q406 (Q101, Q102 DRIVER)
IC401 MICROCOMPUTER
Q401, Q403 MICROCOMPUTER RESET
Q501 VOLTAGE REGULATOR
Q503, Q504 FL DRIVER
Q405, Q502 FL MUTING
V501 FL TUBE
IC503, IC504 FL DRIVER
IC501 LED DRIVER
IC502 EXPANDER
PHONO
TUNER
CD
TAPE 3
REMOTE CONTROL
MINI JACK ASSEMBLY
SEMI CONDUCTORS
IC101 TC9177P
IC201, 202, 401, 601 NJM4558DXC
IC401 PD6027
IC501 TD62504P
IC502 PD0012
IC503, 504 M54562P
Q101, 102 2SC2878
Q301 405 2SC1740S
Q401 2SA933S
Q402, 504 RN2203
Q404, 503, 406, 403 RN1203
Q501 2SD438
Q502 2SA1115
D301~305, 403, 404, 406~426 1S1035
D401 AEL-437
D405 KZL083
D501 KZL061
D701 RD15EB
D502 AEL-404 (RED)
D503~507, 702 AEL-370 (GRN)
D508 1SS131
VR201 ACK-130
VR202, 203 ACK-129
VR601, 802 VRT86X5222
S501~513 ASG-704



Line voltage selection (FOR HE TYPE)

Line voltage can be changed with following steps.

1. Descomment the AC power cord.
2. Remove the top cover.
3. Change the connection wire (To Powertransformer) of Terminal No. 3 (ORANGE) as follows.

Voltage	Terminal No. 3	Terminal No. 5
220V	Orange wire	.....
240V	.....	Orange wire

4. Stick the line voltage lavel on the rear panel.

Part No.	Description
AAX-193	220V lavel
AAX-192	240V lavel

SEMICONDUCTORS

IC 101 MJM204300
102 TC9162N
201,202 PA0016

Q 201A,202A 2SC2238(2SC2275A)
203A,204A 2SA968 (2SA985A)
301,302 2SC2705
303,304 2SC1740S(2SC2603)
305,404 2SD438
401,403 2SD836A
402 2SB750A

Q 501,502 2SA979
503~506 2SC1845
507,508 2SA1145

D 207~210 RD2.7EB (HZ 2.7EB)
301~304 1S1554
305 KZL140
306,307 1S1554
401 RB602

D 402,403 S5566
404,408 RD18EB(HZ18EB)
406,407 RD16EB(HZ16EB)
409 RD27EB(HZ27EB)
410,411 S5566
501~506 1S1555
413~415 1SS131

X
C 302 ACH-383
C 403,404 ACH-390
C 412 ACH-385
C 401, 402 ACH-244

1. RESISTORS:
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT
(V) Signal voltage at 70 W + 70 W, 6 Ω output (1 kHz)
DC voltage (V) at no input signal Value in ( ) is DC voltage at rated power.
4. OTHERS
Signal route
Adjusting point
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
X marked capacitors and resistors have parts unmbers.
The underlined indicates the switch position.

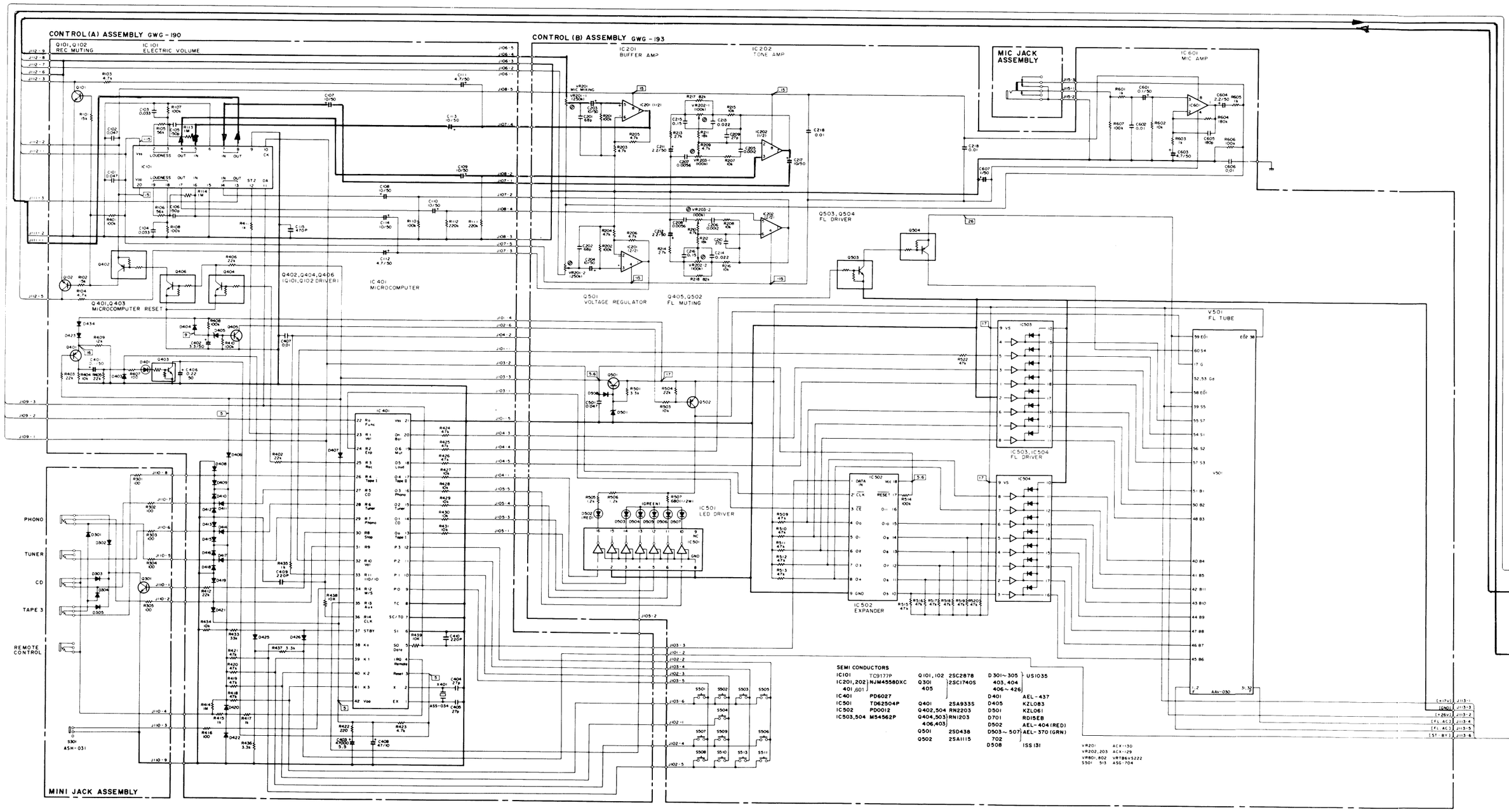
This is the basic schematic diagram, but the actual circut may vary due to improvements in design

5. SWITCHES
S501 PHONO
S502 TUNER
S503 CD
S504 VIDEO AUX
S505 TAPE1
S506 ADAPTOR
S507 VOL UP
S508 VOL DOWN
S509 BAL LEFT
S510 BAL RIGHT
S511 LOUDNESS
S513 MUTING
S301 W S (W-S)

THE UNDERLINED INDICATES THE SWITCH POSITION

7 8 9 10 11 12

A B C D


CONTROL (A) ASSEMBLY GWG-190
Q101, Q102 REC MUTING
IC 101 ELECTRIC VOLUME
CONTROL (B) ASSEMBLY GWG-193
IC 201 BUFFER AMP
IC 202 TONE AMP
MIC JACK ASSEMBLY
IC 601 MIC AMP
Q503, Q504 FL DRIVER
Q501 VOLTAGE REGULATOR
Q405, Q502 FL MUTING
Q402, Q404, Q406 (Q101, Q102 DRIVER)
Q401, Q403 MICROCOMPUTER RESET
IC 401 MICROCOMPUTER
V501 FL TUBE
IC503, IC504 FL DRIVER
IC 501 LED DRIVER
IC 502 EXPANDER
PHONO
TUNER
CD
TAPE 3
REMOTE CONTROL
MINI JACK ASSEMBLY
SEMI CONDUCTORS
IC101 TC9177P
IC201, 202 NJM4558DXC
401, 601
IC401 PD6027
IC501 TD62504P
IC502 PD0012
IC503, 504 M54562P
Q101, 102 2SC2878
Q301 2SC1740S
405
Q401 2SA933S
Q402, 504 RN2203
Q404, 503 RN1203
406, 403
Q501 2SD438
Q502 2SA1115
D301~305 US1035
403, 404
406~426
D401 AEL-437
D405 KZL083
D501 KZL061
D701 RD15EB
D502 AEL-404 (RED)
D503~507 AEL-370 (GRN)
702
D508 ISS131
VR201 ACX-130
VR202, 203 ACX-129
VR801, 802 VRT86VS222
S501 ~ 513 ASG-704

A F ASSEMBLY GWK-252

DRIVER ASSEMBLY GWY-194

Q501 Q508 DIFFERENTIAL AMP

Q401~Q404 VOLTAGE REGULATOR

IC 201, IC 202 NSA IC

Q1~Q4, Q201~Q204 POWER AMP

Q301, Q302 OVERLOARD DETECTOR

Q303, Q304 DC VOLTAGE DETECTOR

Q305 RELY DRIVE

HEADPHONE ASSEMBLY

IC 101 EQUALIZER

IC 102 FUNCTION SWITCH

HEATER TRANSFORMER

T1 POWER TRANSFORMER

Q1,Q3 2SC2922-G
Q2,Q4 2SA1216-G

Line voltage selection (FOR HB TYPE)

Line voltage can be changed with following steps.
1. Descomment the AC power cord.
2. Remove the top cover.
3. Change the connection wire (To Powertransformer) of Terminal No. 5 (ORANGE) as follows.

Voltage	Terminal No. 5	Terminal No. 3
220V	.....	Orange wire
240V	Orange wire	.....

3. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V lavel
AAX-192	240V lavel

SEMICONDUCTORS

IC 101 NJM2043DD
102 TC9162N
201,202 PA0016

Q 201A,202A 2SC2235
203A,204A 2SA965
301,302 2SC2705
303,304 2SC1740S (2SC2603)
305,404 2SD438
401,403 2SD836A
402 2SB750A

Q 501,502 2SA879
503~506 2SC1845
507,508 2SA1145

D 207~210 RD2.7EB (HZ2.7EB)
301~304 1S1554
305 KZL140
306,307 1S1554
401 RB602

D 402,403 S5566
404,408 RD18EB (HZ18EB)
406,407 RD16EB (HZ16EB)
409 RD27EB (HZ27EB)
410,411 S5566
501~506 1S1555
413~415 1SS131

C 302 ACH-383
C 403,404 ACH-390
C 412 ACH-385
C 401,402 ACH-244

5 SWITCHES
S501 PHONO
S502 TUNER
S503 CD
S504 VIDEO AUX
S505 TAPE1
S506 ADAPTOR
S507 VOL UP
S508 VOL DOWN
S509 BAL LEFT
S510 BAL RIGHT
S511 LOUDNESS

S513 MUTING
S301 W S (W S)

* THE UNDERLINED INDICATES THE SWITCH POSITION

1 RESISTORS
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k kΩ, M MΩ, (F) ±1%, (G) ±2%, (K) ±10%, (M) ±20% tolerance
2 CAPACITORS
Indicated in capacity (μF) voltage (V) unless otherwise noted p pF
Indication without voltage is 50V except electrolytic capacitor
3 VOLTAGE CURRENT
V Signal voltage at 70 W + 70 W, 6Ω output (1 kHz)
DC voltage (V) at no-input signal Value in ( ) is DC voltage at rated power
4 OTHERS
Signal route
Adjusting point
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
X marked capacitors and resistors have parts unmbers
The underlined indicates the switch position

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

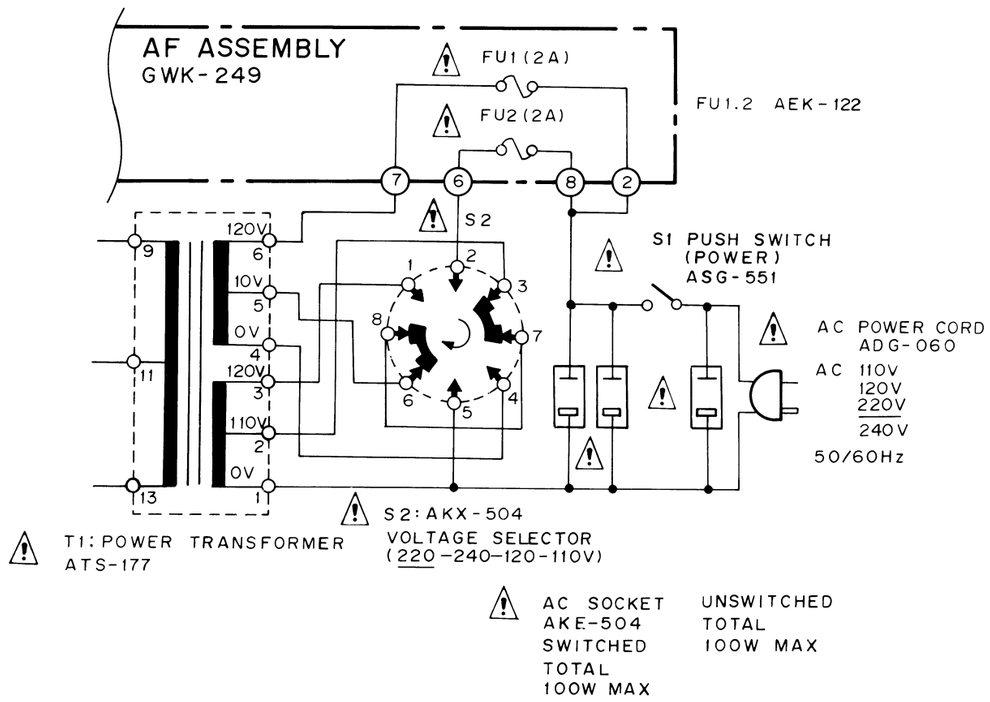
13. FOR S AND S/G TYPES

The S & S/G types are the same as the KU type with the exception of the following section.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.			Remarks
		KU type	S type	S/G type	
⚠ ★	T1 Power transformer (120V)	ATS-176	.....	.....	
	(110V, 120V, 220V, 240V)	.....	ATS-177	ATS-177	
⚠ ★★	FU1 (4A)	AEK-125	.....	.....	
	(2A)	.....	AEK-122	AEK-122	
⚠ ★★	FU2 (2A)	.....	AEK-122	AEK-122	
⚠ ★★	S2 Line voltage selector	.....	AKX-504	AKX-504	
⚠	AC power cord	ADG-088	ADG-060	ADG-060	
	Screw	.....	VTZ30P100FZK	VTZ30P100FZK	
	Sub instructions	ARH-070	ARH-074	ARH-074	

Schematic Diagram



14. FOR HB TYPE

The HB type is the same as the KU type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol & Description		Part No.		Remarks
			KU type	HB type	
	AF assembly		GWK-249	GWK-252	
	Driver assembly		GWY-156	GWY-194	
⚠ ★★	Q2, Q4		2SA1216-G/P/Y	2SA1216-G	
⚠ ★★	Q1, Q3		2SC2922-G/P/Y	2SC2922-G	
⚠ ★	T1 Power transformer	(120V)	ATS-176	.....	
		(240V)	.....	ATS-178	
⚠	AC socket		AKP-504	AKP-505	
⚠ ★★	S1 Push switch	(POWER)	ASG-551 (ASG-549)	ASG-552	
⚠ ★★	FU1	(4A)	AEK-125	.....	
		(T2.5A)	.....	AEK-018	
⚠ ★★	FU2	(T1.25A)	.....	AEK-403	
⚠	Power cord		ADG-088	ADG-063	

AF assembly

The AF assembly (GWK-252) is the same as the GWK-249 with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		GWK-249	GWK-252	
★★	Q201, Q202	2SC2238	2SC2235	
★★	Q203, Q204	2SA968	2SA965 (A)	
★	D201 – D204	KZL056	.....	
★	D404	RD22EB	RD18EB	
★	D413 – D415	.....	1SS131	
	C225, C226	.....	CQMA472K50	
	C302	CEANP2R2M50	ACH-383	
	C403, C404	CEA100M50L	ACH-390	
	C412	CEA470M50L	ACH-385	
	R247	.....	RD1/4PM102J	
	R248	.....	RD1/8PM102J	
	R249, R250	.....	RD1/8PM220J	
	R313, R314	RS1PMF182J	RS2LMF122J	
	R319	RD1/8PM124J	RD1/8PM104J	
	R323, R324	.....	RD1/8PM101J	
	R404, R406	RD1/4PMFL270J	RD1/4PMFL100J	
	R408	RD1/4PMFL4R7J	RFA1/4PS4R7J	
	R410	RFA1/4PS100J	RD1/4PM471J	
	R412	RD1/8PM220J	.....	
⚠ ★	T401 Heater transformer	ATS-141	ATS-180	

Driver assembly (GWY-194)

The driver assembly (GWY-194) is the same as the GWY-156 with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		GWY-156	GWY-194	
⚠	R507 – R510	RD1/8PM 153J	RD1/8PM 223J	
	R519, R520	RD1/4PMFL272J	RS2LMF682J	
	R511, R512	RFA1/4PS271J	RD1/4PM391J	
	R513, R514	RFA1/4PS820J	RD1/4PM820J	

Q501, 502 : 2SA979
Q503~506 : 2SC1845
Q507, 508 2SA1145

D501~506 : USI035

P.C. Board Pattern

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emarks

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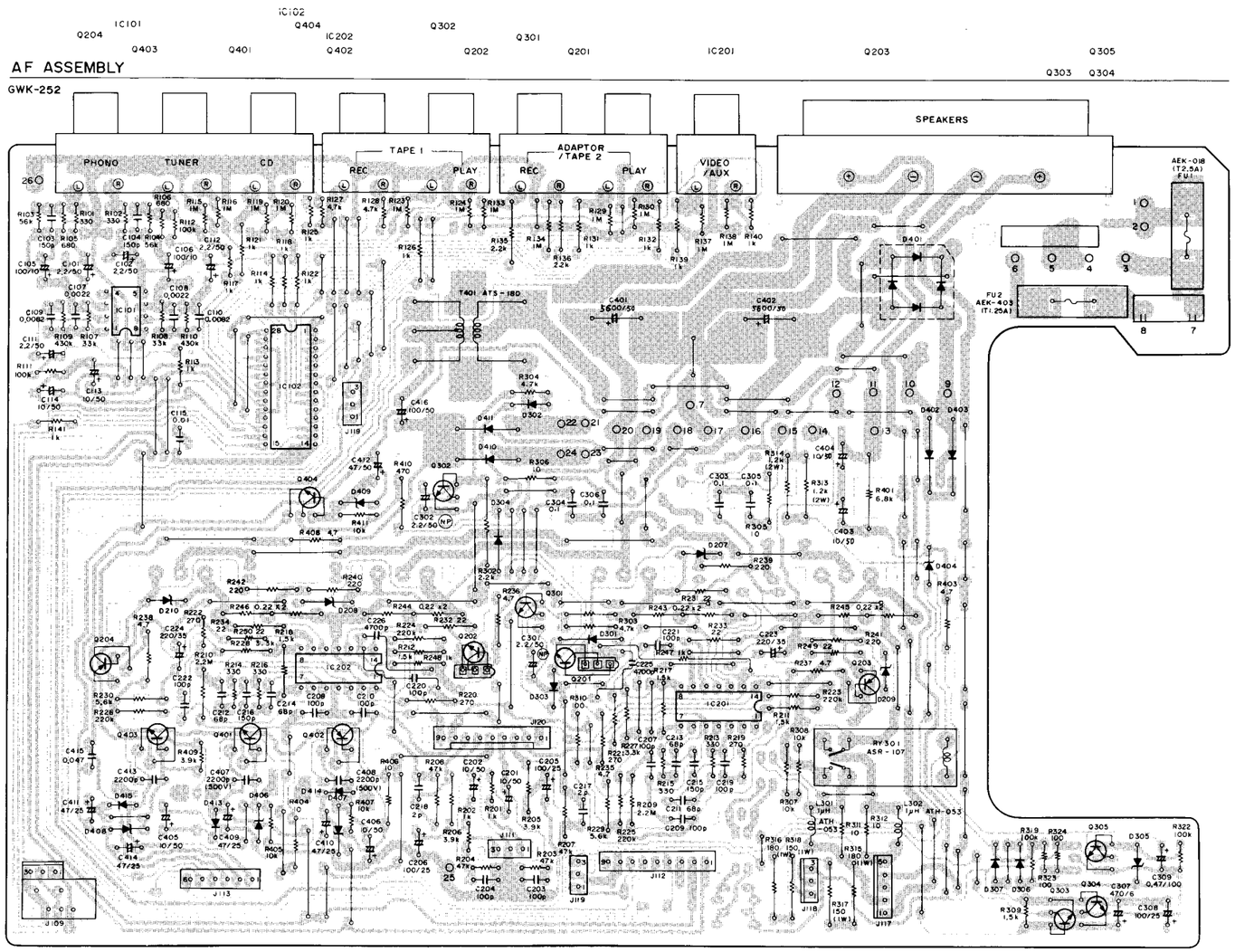
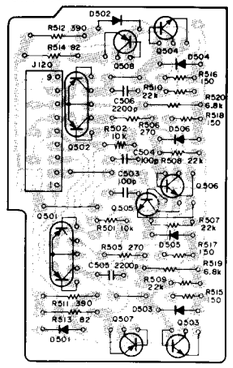
emarks

AF ASSEMBLY
GWK-252



Q201A, 202A	: 2SC2235
Q203A, 204A	: 2SA965
Q301, 302	: 2SC2705
Q303, 304	: 2SC1740S (2SC2603)
Q305	: 2SD438(A)
Q401, 403	: 2SD836 A
Q402	: 2SB750A
Q404	: 2SD438
IC101	: NJM2043DD
IC102	: TC9162N
IC201, 202	: PA0016
D207~210,	: RD2.7EB
D301~304, 306, 307	: 1S1554
D305	: KZL140
D401	: RB602
D402, 403	: S5566
D404	: RD18EB
D406, 407	: RD16EB
D409	: RD27EB
D410, 411	: S5566
D413~415	: 1SS131

DRIVER ASSEMBLY
GWY-194



Q501, 502 : 2SA979
Q503~506 : 2SC1845
Q507, 508 2SA1145

D501~506 : US1035